Disruption Management & Design

Karan Dokras

Product Development || Sales || Core Team || AKIVA, Gurgaon, Haryana, India

Uday Dokras

B.Sc., B.A. (managerial economics) LL.B. Nagpur University,INDIA
Graduate Studies, Queen's University,Kingston,CANADA
MBA CALSATATE USA
Graduate Diploma in Law, Stockholm University,SWEDEN
Ph.D. Stockholm University,SWEDEN
CONSULTANT Human Resource and Administration, FDCM ESSELWORLD GOREWADA ZOO Pvt.Ltd..

Disruption Management & Design

Indo Nordic Author's Collective, Stockholm SWEDEN Tampere FINLAND and Nagpur INDIA

PUBLISHED BY

Indo Nordic Author's Collective, Stockholm, Sweden; Tampere, Finland and Nagpur, India

First Edition 2020
Copyright 2019 Karan Uday Dokras. All Rights Reserved. No part of this publication may be reproduced, stored in a retrieval system, transmitted in any form or by means of electronic, mechanical, photocopy, micro-film, recording or otherwise, without prior permission of the copyright holder.
ISBN No. applied for. Cost US $150. I N R 1500/- Euro120

Disruption Management & Design

(First Edition)

ACKNOWLEDGMENT

We thank - Us. Veni Vedi Vici. Always…

Karan Dokras
Dr.Uday Dokras

MISSION STATEMENT:
DISRUPTION

Di
sruption
Management & Design

Karan Dokras

Product Development || Sales || Core Team || AKIVA, Gurgaon, Haryana, India

---

Dr. UDAY DOKRAS

B.Sc., B.A. (Managerial Economics) LL.B. Nagpur University, INDIA
Graduate Studies, Queen's University, Kingston, CANADA
MBA CALSATATE USA
Graduate Diploma in Law, Stockholm University, SWEDEN
Ph.D. Stockholm University, SWEDEN
CONSULTANT Human Resource and Administration,
FDCM ESSELWORLD GOREWADA ZOO Pvt. Ltd

Disruption Management & Design

Karan Dokras

Product Development || Sales || Core Team || AKIVA, Gurgaon, Haryana, India

---

Dr. UDAY DOKRAS

CONSULTANT Human Resource & Admin. FDCM ESSELWORLD GOREWADA ZOO Pvt. Lt

C O N T E N T S

Acknowledgment. pp 5

Contents. pp 9-10

Forward. pp 11-14

I N T R O D U C T I O N. page 15

CHAPTER 1. What is Disruption pp16-24

C H A P T E R 2. **Disruption and Human Resources pp. 25 to 32**

Chapter 3 Disruption and Architecture pp. 33 to 39

C H A P T E R 4. Human Resources in Projects pp. to 40 to 46

C H A P T E R 5. The Role of Human Resource Management in the Knowledge and Application of Project Management and its Tools pp 47 to 54

C H A P T E R 6. Human Resource Management Interventions in Projects pp. 55-62

C H A P T E R 7. ENDING THE PROJECT-The Role of Human Resources in tying loose ends. Pp 63-69

C H A P T E R 8. Innovative HR in Today's Scenario PP 70 to 77

C H A P T E R 9. Adjectives in Architectural Visual Context e pp 78 to 83

CHAPTER 10. Arabesque in Architecture pp 84to 90

C H A P T E R 11. Islamic Mathematics as Art pp. 91- 102

C H A P T E R 12. Prosumption in Architecture. pp 103-111

C H A P T E R 13. AlHambra pp.112 to 129

Chapter 14. The Mosque at Medina pp 130-153

C H A P T E R 15. The Concept of Housing in Islam 154 to 160

C H A P T E R 16. 'Carpe Noctem' - A journey into Architectural Media pp 161-166

C H A P T E R 17. DOKRAS WADA, Courtyard Houses of Maharashtra pp 167-176

CHAPTER 18 Comparison of the Human body with Hindu Temple pp 177-189

CHAPTER 19. Marketing Ayurveda Recent Trends 190-220

CHAPTER 20. Ayurveda on Every Table-The New Age pp 221- 242

CHAPTER 21. GHEE pp 243- 296

CHAPTER 22. HR in the Housing Sector Pp 297-306

Pre-publication Reviews. Page 307

About the Authors. Pp 308

Review of Dr Dokras' Books pp 309

Referred to by pp 310

About the Author Karan Dokras pp 314

Foreword

Mandarin word chá and the Sanskrit word GHEE

Who brought the word disruption to my knowledge? We had been disrupting all along. Not just us- the two authors but starting from the beginning of mankind disruption can be visible to those who dare to look. Look at الفتوحات الإسلامية *al-Futūḥāt al-Islāmiyya -early Arab and Islamic conquests that began with the prophet Muhammad in the 7th century. Within 700 years after Christ established Christianity it was disrupted by Islamic conquests.Formation of a state in the Arabian penninsula and ideological (i.e., religious) coherence and mobilization was a primary reason why the Muslim armies in the space of a hundred years were able to establish the largest pre-modern empire until that time. It stretched from the borders of China and the Indian subcontinent, across the Middle East, North Africa, Central Asia, the Caucasus, and parts of Europe (Sicily and the Iberian Peninsula to the Pyrenees).The estimates for the size of the Islamic Caliphate suggest it was more than thirteen million square kilometers (five million square miles).The Arabian empire extended two hundred days journey from east to west, from the confines of Tartary and India to the shores of the Atlantic Ocean. The language and laws of the Quran were studied with equal devotion at Samarcand and Seville: the Moor and the Indian embraced as countrymen and brothers in the pilgrimage of Mecca; and the Arabian language was adopted as the popular idiom in all the provinces to the westward of the Tigris. Christianity was disrupted.Look at this amazing disruption- Millions of people, Christian and non-Christian, soldiers and non-combatants lost their lives during the Crusades which*

were a series of religious and political wars fought between 1096 and 1291 for control of the Holy Land. In addition to the enormous loss of life, the debt incurred and other economic costs associated with the multiple excursions to the Middle East impacted all levels of society, from individual families and villages, to budding nation-states. The wars also resulted in the destruction of cities and towns that lay in the crusaders' wake. In his Decline and Fall of the Roman Empire, Edward Gibbon refers to the Crusades as an event in which "the lives and labours of millions, which were buried in the East, would have been more profitably employed in the improvement of their native country."

In the same spirit one of us- Karan - had started 2 tea Companies in the Food space in India - the first one CHYMEY did disrupt established players and is still a long way off but will catch on soon enough. The other Kettle and Brew also disrupted the tea scenario in the city of PUNE, India

TEA WARS: But another interesting example in the history of disruptions also includes the tea wars- a topic I choose to talk about only because of our antecedents with that famous drink. By the 19th century, the British became a nation of tea drinkers, and the demand for Chinese tea rose astronomically. The East India Company had given up the monopoly privileges on all trade in 1833, and the free trade was already started. As the demand of tea increased, the cost to the exporting country also increased. Silver began to flow out of England. At the time, England was facing a shortage of silver after the War for American Independence, and for the industry revolution, they needed more silver. To solve the problem, East India Company conceived a bright idea of exporting woolen fabrics to India, and exporting opium from India to China, which was called "Triangle trade".

After 1830, the amount of opium exportation to China had risen to 20000 boxes, then in 1835, it even increased to 30000 boxes. The consumption began to skyrocket, and in 1839, 40000 boxes opium was exported to China. Large amount of silver was flowing out from China to pay for the opium. China faced serious economic crisis and the opium weakened a large percentage of the population. Around 1839, after an incident in which a Chinese man was killed by drunken British sailor the TEA war was started. British sent their military marines with the powerful weapons, but China could not match the powerful British forces and new technology. In 1842, China agreed to the provisions of the treaty. China was forced to accept the British demands and sign the agreement. Hong Kong was ceded to

Great Britain, and other five ports including Shanghai and Guangdong were opened to British residence and trade. After the war, the amount of tea exporting from China increased.

There is an extraordinary story of the most ubiquitous and familiar Indian street drink (food) in India and it was the great engines that drove globalisation of the world economy. It caused wars and boosted the trade in slaves and hard drugs. The conditions it is produced under are still so bad that the Duke and Duchess of Cambridge decided not to include it in their recent tour of India. In The USA, *Tea Act of May 10, 1773, allowed the British East India Company to sell tea from China in American colonies without paying taxes. The Boston Tea Party was a political and mercantile protest by the Sons of Liberty in Boston, Massachusetts, on December 16, 1773. The target was the American Patriots strongly opposed the taxes in the Townshend Act as a violation of their rights. Demonstrators, some disguised as Native Americans, destroyed an entire shipment of tea sent by the East India Company. They boarded the ships and threw the chests of tea into the Boston Harbor. The British government responded harshly and the episode escalated into the American Revolution.*

Now, ofcourse, he is busy selling Ghee and other OTC items but in ancient India, whenever walls were faught, wells were dug and filled with Ghee to treat the wounded in Battle, because Ghee has the quality of healing or ROPANA and it facilitates recovery from Wounds. Cow Ghee has been used in lamps in temples and pujas all over India. It is said that the light of a Ghee lamp is more beautiful and brilliant than any other light. The light of burning Ghee is said to ward off negativity and evil influence. Ghee has dominated most Indian kitchens for centuries. Use of ghee in sweets is viewed by customers as the symbol of their quality and richness. But the metabolic epidemic comprising of diabetes, heart disease, obesity and hypertension (metabolic syndrome X) which have emerged in the recent decades in India has put a question mark on this Indian favorite cooking medium. Ghee has been used for centuries as a digestive and elimination aid, for energy, sexual vitality,skin and eye health, as a lubricant for the joints and for alkalising the blood. That low lying substance so fond to us religiously and culturally is making a huge comeback on the OTC market by more than 2 dozen companies that are disrupting the Dairies, grandmother's home made supply of ghee and Karan is a

part of that disruption.

"Great companies start because the founders want to change the world… not make a fast buck." Said Guy Kawasaki. "The reason why it is so difficult for existing firms to capitalize on disruptive innovations is that their processes and their business model that make them good at the existing business actually make them bad at competing for the disruption."(Clayton Christensen). We hope this book will help you understand disruption and see the design and managerial displays of wisdom that we have sought to string together in this necklace of our work.

The Authors

INTRODUCTION

This is a collection of the work of Dr Uday Dokras, a prolific writer who has published more than 50 research papers and 7 books- this is the 7 th one and whom I have the good fortune of knowing since the past 43 years, his son Karan Dokras a writer and start-up aficionado and daughter Srishti Dokras (who wishes to stay anonymous vis a via her essays).

I remember Uday from the days he worked in SODEXO, Stockholm, Sweden and I was his Chief. In these essays this spirited and erudite author re-publishes and re-establishes in his work (Research Papers) in a book format. These essays span the gamut from the arts and intelligence to creativity, leadership, management and architectural ethics and together with his son the two authors describe their own interpretation of disruption and how origination strikes at the heart of mankind throughout the ages- whether the Islamic World, Human Resources, Management or Design. Beautifully brought together in this unique collection. Enjoy reading these 22 essays that journey through new age dynamics and innovation-each unique to its own time.

Ms. Ylva Arnold
Bachelor of Human Resources from University at Örebro, Sweden

Former-Head- HR- Inhouse AB
Head- HR -Transdev AB,SWEDEN
Head of Personnel- Karolinska University and Hospital,Solna SWEDEN
HR Manager –THE Royal Opera, Stockholm,SWEDEN

"I want you to find a bold and innovative way to do everything exactly the same way it's been done for 25 years!"

CHAPTER 1

DISRUPTION- What is it all about?

The Times They Are a-Changin'
BOB DYLAN

When somebody tells you about a book, you go online and buy it on Amazon. When you arrive at an airport, you call an Uber instead of go to the taxi stand. When you go on vacation with your family, you look for Airbnb instead of staying in a hotel. These little decisions that we consumers make, multiplied by millions of people doing it all of the time, that's what is disrupting these markets. Not the technologies.

Thales Teixeira Professor Harvard Business School

The emergence of a new technology is often cited as what drives the disruption of an industry or business. Instead, startups disrupt established companies by decoupling the customer value chain — picking one aspect of the business and doing it better than the incumbent.[1]

The topic of industry disruption — "a process whereby a smaller company with fewer resources is able to successfully challenge established incumbent businesses" — is rife with fallacies. Technology continues to disrupt almost every business sector with constant advancements and amazing new use cases. No industry is wholly immune from the impact of technology; however, the emergence of new technology is not the cause of disruptions. Rather, startups disrupt established companies by decoupling the customer value chain — picking one aspect of the business and doing it better than the incumbent.[1]

The future of all industry is disruption – and that's a good thing.[2] Disruption across all industries is inevitable, but rather than bracing for the change, this Accenture's new Disruptability Index shows that businesses should be confident to embrace it. Embracing change and quickly is the answer to persisting in the face of this rising tide. Today, 63 % of companies are experiencing disruption. [3]

Digital disruption is an inevitability of the future. New tech is emerging at an ever more rapid pace, companies now must decide if they are going to be disrupted or start doing the disrupting themselves. Those that don't start to innovate with new technologies will be left behind by those who chose to adapt and bring greater efficiencies to their work processes. Up until now many have chosen not to put the time and work in but are starting to notice the change that startups across a number of nations are making. They are beginning to see that they must embrace these technologies to survive and invest in start-ups to give them an edge over competitors. In the digital age, organisations that are unable to achieve a successful transformation are losing profitability just as badly as those that continue to ignore the digital imperative. The fact is, the majority of companies that do attempt a transformation get it wrong. Looking at case studies of those that fail can be a good way of figuring out the secrets to success.

Most companies now recognise the importance of adopting digital technology, and most are in the process of doing so. However, far fewer truly understand how and why it's important, and how to implement digital tech to their best advantage. When companies fail at digital transformation, it's often because they're not approaching it from the right perspective. Digital transformation is about adopting new technology in order to better serve consumers—so the best way to approach it is from a customer-focused perspective. Sometimes, failure stems from the fact that the company doesn't use the right tools, or attempts the transformation without a clear understanding of what technology should drive and facilitate the transformation. And sometimes, it's a simple lack of planning that's the culprit.

Start-ups often understand their audience and their needs better than long-term enterprise businesses which are why we have seen so many big-name retailers go out of business in favor of smaller more innovative and connected companies that have recently emerged. The market has also changed dramatically, millennials have the biggest spending power of any generation and are more interested in experience over accumulation things. They are focused on the trust of brands and as such brands have had to adapt creating content and building relationships with their customer base. As E-commerce has changed the market share of last mile delivery to B2C instead of B2B retailers are

having to accommodate the need to be able to easily deliver to urban areas. Technology like droids and drones and the innovation of bike messengers are changing how the retail world operates and how much consumers expect out of brands.

The case of Kuoni the Swisss Travel giant illustrates the challenges for a non-digital player adjusting to digital disruption in the travel and tourism industry. The rise and fall of Kuoni illustrates the 'boiling frog' syndrome – i.e., while threats to its business multiplied, there was no 'wake up' moment where managers made decisive changes before it was too late.[4]

Kuoni failed to understand the growth opportunities and threats of digitalisation for industries and individual companies. Digital disruptors (exemplified by Expedia, TripAdvisor, Booking.com, priceline.com were able to adopt to digital transformation and Kuoni's failure to digitalize brought about its downfall. That was the only choice left after 15 years of continuous decline and ongoing failure to recover. Not that Kuoni was new to embracing new ways of doing business. In 2005 they had began using TEALEAF to reignite their customer experience. Tealeaf was founded by Robert Wenig, Randi Barshack, and Igor Tsyganskiy in November 1999. This was a software to record all the dynamically generated HTML at the network level and store it for later searching and visual replay- a dominant feature of customer analytics. For many years however the management did not recognize the reasons behind this decline. Year after year they found new explanations: 9/11, terror attacks in Egypt, the market entry of big German competitors, a particularly sunny winter taking away people's lust for traveling, and so on. Failing to diagnose the underlying change in market dynamics. When they finally recognized the incredible growth rates in online business, which around the mid-2000s became significant business volume in the total market too, they made "going online" a top priority. Kuoni's major issue is the same as that of countless other companies that failed to recognise the significance of disruptive technologies and business models: it believed it could continue to thrive by relying on its established business model—that its customers would continue to choose face-to-face interactions rather than book travel via digital methods. They also failed to understand that the refusal to go digital meant they weren't able to deliver a competitive level of value.

Alex Rampell, a partner at technology venture capitalist firm Andreessen Horowitz, said the "battle between every startup and incumbent comes down to whether the startup gets distribution before the

incumbent gets innovation." Research by Accenture[5] has shown that disruptors tend to be successful in three ways:

1 They dramatically lower historic prices through new cost structures

2 They deliver significant innovation in products and experiences for consumers

3 They break down incumbent defences and barriers to entry

According to them 4 stages and consequently 4 actions are needed to focus on Disruption attacks.

1. Viability
1. Durability
2. Vulnerability
3. Volitility

1. In the *Viability* period, they say it is time to focus on growing the core business by offering new products in existing markets, or expanding the footprint of existing products to new markets.
2. In the *Durability* period, the emphasis needs to be on transforming the core business to maintain cost leadership, while experimenting massively with new disruptive businesses.
3. In the *Vulnerability* period, where incumbents benefit from the continued presence of high barriers to entry, it is time to scale up new opportunities.
4. In the *Volatility* period, where there are pressing issues in the core business to address, focus should be placed on retaining only the relevant parts of the core business, while increasingly redirecting investment capacity to grow new businesses.

Apart from that we may also need:

A. Leadership
B. Leadership consistency
C. Monitor and react to disruption
D. Customers first

The threat of innovation from competitors and the speed with which consumer preferences can shift are potentially fatal for businesses. They need to keep moving as "the first one now will later be last. For the times, they are a-changin".

On The Cusp Of Technological Disruption, Expert Panel, Forbes Technology Council, 2019

Technology continues to disrupt almost every business sector with constant advancements and amazing new use cases. No industry is wholly immune from the impact of technology; however, some are more ready for major change than others.

The experts of Forbes Technology Council are often ahead of the curve when it comes to tech trends.

1. Healthcare Diagnostics
2. Financial And Legal Services
3. Education
4. Data Protection
5. Customer Services
6. Insurance
7. Security
8. Making life paperless

Others have identified several more options:

9. Transport & logistics
10. Oil & Gas
11. Construction
12. Real Estate
13. AirTravel

Of these we shall look at 5 to help understand impending disruptive trends

1. Healthcare Diagnostics

For some years, several years, one of us- the two authors was head of Human Resources in a Group of Hospitals and several Graduate and postgraduate medical education Institutions attached to these. Those days managing one's health was challenging, time-consuming, and stressful. Today finding a good health care provider is not so difficult, and the cost of health care is on the way down. Internet, mobile devices and artificial intelligence (AI) are combining to drive improvements in the collection and analysis of healthcare data. Digital disruption has brought new and greater opportunities for the

Healthcare industry to provide a more reliable and personalized service. Suppliers are now recognizing the need to innovate and improve the current systems they have in place. Tech-savvy start-ups are a key driver of these innovations. Mobile devices are a key part of the disruption to the industry, they allow remote-monitoring and remote check-ups with patients. As patient behavior changes and people are happier to be treated from home rather than in a hospital setting these technologies are only expected to grow. Almost a quarter of the world's population or 1.7 billion people downloaded ta medical app in 2017.

The implications for mobile health treatments are endless and they are causing a massive shakeup in the wold healthcare industry by providing a cheaper and easier alternative to expensive hospital visits and medication. Startups like MySugar, based in Australia are already helping over 1 million people manage their diabetes through their mobile device. It helps users make decisions between doctor's visits by showing their treatment data in an easy and accessible manner and helping them calculate their insulin. They're moving diagnostics from hospitals to our homes, leveraging AI to screen cancer with a mobile app. and discover health anomalies from data collected by wearable devices. This disruption will only hasten as technology improvements revolutionize preventive care. Also because of the aging population, reimbursement changes, and uncertainty about payers and their stability, healthcare providers are now looking for ways to create more opportunities for self- care and preventive care. The traditional office visit is ripe for disruption. The cost of medical procedures varies wildly between hospitals. PrimeInsurance, PrimeDoctors and PrimeHealth are digital foreys into the mushrooming field

2. Education

The eight key education trends as per Googlein a report Google for Education from a live conference of Thursday 3rd October 2019 [5] are:

- Digital responsibility
- Life skills and workforce preparation
- Innovating pedagogy
- Computational thinking
- Student-led learning
- Collaborative classrooms
- Connecting guardians and schools
- Emerging technologies

The trend in education will be towards personalization—finding out the unique interests of the child and letting them explore that curiosity in other subjects.The mass approach to education is one way to be discarded.

3. Real Estate. The process of buying a house is complicated, lengthy, and involves many steps and processes that add little value for the consumer and could be improved by automation. The high cost of transactions is also a concern, with one of the highest being the agent's fee. Customers are increasingly questioning the value of real estate agents when they can both list and shop homes online.

Although there is a great deal of regulation from both the government and mortgage providers, much of the process can be handled online. The mortgage and home buying process is a great opportunity for robo-advisers, similar to what we have seen in investing.This industry provides a classic example for disruption. The customer purchasing experience will be enhanced to exclude Agents and include more transparency making costs clear, consistent, and easy to understand.

4. Construction

Engineering and Architecture firms are embracing start-ups 3D printing technologies to create detailed and accurate scale models of buildings as well as creating life-size parts on 3D printers that are difficult to produce, saving time and money. Technologies such as new smart materials, VR, and 3D printing has caused massive disruption to the industry over the past few years, allowing for a more creative, efficient and stable construction process. This can have massive implications within many parts of not only poorer nations but the west as well that are experiencing a housing crisis due to exploding populations and construction workers being unable to meet this demand.(See Chapter 3)

5. **E-commerce & Retail**: 82% of consumers consult their phone for research before making a purchase. The online retail industry has changed dramatically over the past 10 years, many companies this time a decade ago would not have been selling their products online. Mobile shopping has probably been one of the biggest disruptions to retail in the industries. 24x7x365 is the time line the on-line stores keep open their "doors". "The North American retail landscape looks quite different today than it did even ten years ago. The way that consumers make purchasing decisions has dramatically altered: they stand in stores, using their smartphones to compare prices and product

reviews; family and friends instantly weigh in on shopping decisions via social media; and when they're ready to buy, an ever-growing list of online retailers deliver products directly to them, sometimes on the same day."[6]

These shifts have led a number of industry observers to forecast the end of retail as we know it. Some predict that retail will change more in the next five years than it has over the past century and that the extinction of brick-and-mortar stores isn't far off. Our view is less dramatic, but we do believe that big changes are inevitable and that retailers must act now to win in the long term.

Challenging consumer behaviour is closing down Book stores. Why should I walk down to a store when I can access any number of titles on Amazon and not only that get a review, a rating on a 5 star scale from those who have read and probably a less expensive price. This is what amazon did. Now one can buy books without experiencing them, per se.These are all changing consumer behaviors. When somebody tells you about a book, you go online and buy it on Amazon. When you arrive at an airport, you call an Uber instead of go to the taxi stand. When you go on vacation with your family, you look for Airbnb or OYO Hotels. "These little decisions that we consumers make, multiplied by millions of people doing it all of the time, that's what is disrupting these markets. Not the technologies."

Industry disruption, is reasonably predictable to the agile manager and offers tremendous opportunity to those on the lookout for the Kill. And as the rate of disruption escalates, an increase in computing power, technology adoption and information sharing are global shifts that help make markets more efficient, give companies access to a broader pool of talent and resources and expand competition to a global scale. The resulting changes and pressures are challenging virtually all companies, from startups to established enterprises.

Five years ago, carmakers and suppliers had roughly the same price-to-earnings ratios. But they have since diverged: As of August 2017, German carmakers' valuations had fallen to just seven times this year's earnings, while large suppliers' valuations increased to 12.7 times their earnings. Three megatrends—electrification, car sharing, and autonomous driving—are changing the business model for carmakers more rapidly than for suppliers. With carmakers now investing heavily to respond—Volkswagen AG, for example, will spend US$24 billion to build electric versions of all 300 models in the 12-brand group's line-up—other parts of the value chain will need to be wary of their susceptibility to future disruption.[4]

R E F E R E N C E S

1. What's Really Driving Disruption (It's Not Technology), Mar 28, 2019, Knowledge@Wharton https://knowledge.wharton.upenn.edu/article/what-drives-disruption/

2. 3. Accenture analysed 3,600 of the largest companies in the world and found they are spending increasing amounts of money to identify the next big thing. And yet profits of incumbent companies are down and the scale of corporate bankruptcies is up.

3. Kuoni: Missing the Digital Boat - The Downfall of an Icon in the Travel Industry,*by Joerg Niessing, Jan Sedlacek, Lisa Duke, INSEAD Cases , published: 21 Feb 2019*

   https://cases.insead.edu/publishing/case?code=37693

4. Disruption Need Not be an Enigma,2018 https://www.accenture.com/_acnmedia/pdf-72/accenture-disruptability-index-pov-final.pdf

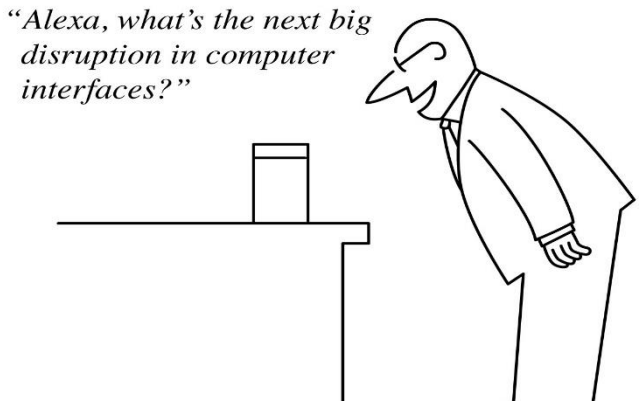
5. Future of the Classroom Emerging Trends in K-12 Education. GLOBAL EDITION. https://edtechnology.co.uk/Article/future-of-the-classroom-eight-top-education-trends-revealed-by-google/

6. How Retailers can Keep up with consumers.https://www.mckinsey.com/industries/retail/our-insights/how-retailers-can-keep-up-with-consumers

Chapter 2

Disruption and Human Resources

According to Wikipedia, in 1893 the economist John R. Commons first used the term "human resource" in his book, *The Distribution of Wealth*. The term was used again in the early 1900s as "the notion that workers could be seen as a kind of capital asset" became popular. Human Resources became more widely used in the 19th century, reportedly due to misunderstandings between employers and their workforce.



Disruptive Innovation is the phenomenon by which an innovation transforms an existing market or sector by introducing simplicity, convenience, accessibility, and affordability where complication and high cost have become the status quo—eventually completely redefining the industry. It has played out in markets from home entertainment to teeth whitening, and it could make better HR- Human Resources. Earlier, HR used to be called "Personnel Management." Later it transformed itself from transactional and administrative function towards compliance and talent management, and it became known as Human Resources.

Human resources is used to describe both the people who work for a company or organization and the department responsible for managing resources related to employees. The term *human resources* was first coined in the 1960s when the value of labor relations began to garner attention and when notions

such as motivation, organizational behavior, and selection assessments began to take shape.Today,Human resource management is a contemporary, umbrella term used to describe the management and development of employees in an organization. Also called personnel or talent management (although these terms are a bit antiquated), human resource management involves overseeing all things related to managing an organization's human capital. Better still it is called "People and Culture," which reflects the continuing shift to focus on the employee experience and productivity – ensuring people can perform at their best. Despite these name changes and shifts of focus, a study running since 1995 found that for 20+ years there has been little change in how HR allocates its time. In fact, the authors say that there has been "more discussion of change than actual change."

For example, until a couple of years ago, performance management processes had barely changed since World War II. And some recruiters still spend most of their time manually sifting through resumes instead of using intelligent software, talent communities, alumni databases, and advanced recruiting marketing strategies.

DIGITALIZATION

HR today still not reshaped itself to fit in the digital landscape but the world seems to have moved on. Simply fine tuning their recruiting tools or their learning systems over the last 10-15 years is not enough. They say that most core HR systems in large organizations are 8 years old or older and do not connect to all the other pieces of the HR puzzle, like performance, learning, and remuneration.

Way back in 2013-Oxford Martin School study that estimated that 47% of all jobs could be automated in the next 20 years i.e. by 2034.[1]

In fact, the role of human resources has undergone tremendous change in the last few years. The modern day HR does more than simple 'recruitment and hiring'. In the contemporary workplace where finding and retaining top talents is a challenge, the modern HR takes care of not only positioning of the employees but also ensures that they are positively engaged through various means like constant feedback and training to upgrade their skills. Whether it is about building a company culture or developing a strategy for the organization, human resources play a pivotal role in all these along with taking care of all employee-centric activities like – on-boarding, training and development

among others. So you can consider human resources as a base of an organizational structure on which all the other resources stand and thrive.

Here are some of the functions that a human resource performs in an organization –

1. Selection and recruitments
2. On-boarding new employees
3. Talent (employees) management
4. Playing the bridge between employees and the top management
5. Employees' training and development programs

In short, the human resource department forms the crux of an organization that creates, implements and oversees policies between employees and the top management. The role of an HR is crucial because it talks about the most important resource – humans i.e. employees or talent in business parlance.We need to stop refining concepts for HR that were designed for the world of today and yesterday. The world of tomorrow is going to be much different, that current concepts will be misaligned in the world of tomorrow. And if we keep refining them, our profession will become increasingly irrelevant. We do not need an evolution, we will need a disruptive revolution or re-imagination of our profession to stay relevant for the years to come. Every organization and our profession will inevitably be impacted, the speed and magnitude of this impact will largely be driven by "change appetite": do you want to be "ahead of the curve", do you want to "go with the flow" or do you rather be "late in the game" and learn from others or, possibly the least attractive option; do you want change to be done to you. Disruption presents as many opportunities as it does challenges. Now is the time for HR professionals to shape the future of their industry and play a significant role in the direction of their organization.

HR is more important than you might think. It's a bit of a cliché, but for most organizations, people are their most important asset. People are typically one of the top two or three expenses in an organisation and nothing much gets done without people. And who is the custodian of the organisations people? HR, of course!

In three successive years, Deloitte, the premier Consulting firm - a brand under which tens of thousands of dedicated professionals in independent firms throughout the world collaborate to provide audit, consulting, financial advisory, risk management, and tax services to selected clients- touched upon HR changes in the ongoing disruptive scenario. In a 2016 report *Sustainable HR in an age of disruption How HR can harness a next-generation digital workplace to create capacity, grow capability, empower community, and boost credibility* it argued that the digital workplace, enabled an adaptive and evolving HR operating model and service delivery model built around the HR customer experience, playing an important role in boosting HR credibility. Therefore there was the need to understand and synthesize HR customer needs by conducting voice-of-the-customer interviews and listening to HR customer stories, desired emotional responses for the relevant personas began to emerge. With the prioritized personas in place, the team translated the interviews and customer stories into HR journey maps.

In 2018 they spoke of 10 "HR Technology Disruptions for 2018."

1) A Massive shift from "automation" to "productivity."

For many years the focus on HR technology was to automate and integrate HR practices such as online payroll, record-keeping, learning management, resume capture, interview and hiring, assessment, performance appraisals, compensation, management, resume capture, interview and hiring, assessment, performance appraisals, compensation, etc.with 45% of companies still focused on basic process automation. But beyond this automation there is urgent need today of productivity. Can we build HR software that really improves productivity and helps teams work better together? That's the next challenge.

2) Acceleration of HRMS and HCM (Human Capital Management) Cloud Solutions. In the last five years, cloud-based HR has become the rage. So the question for most companies is no longer "if" you go to the cloud, but rather "when" and "how."Despite these rapidly maturing solutions, only about 40% of companies in the USA today use cloud HCM solutions. The cloud HR and payroll system is a critical system for any business so is the talent and team management software, making employees' lives easier.[2]

3) Continuous Performance Management Is Here:The Report suggests that continuous performance management is possible, it works, and it can transform a company involving building a new, ongoing process for goal setting, coaching, evaluation, and feedback "team-centric" tools that are likely to help the future leaders in the HCM market of the future.

4) Feedback, Engagement, and Analytics Tools Reign: Today the engagement survey market is a dynamic world of real-time survey systems, sentiment analysis software, organizational network analysis tools, and products that actually automatically ask your peers for feedback to give you real-time coaching. Open feedback tools are growing again, giving employees many new places to comment on the workplace. A new area of growth is the explosion of systems to offer pay transparency and are now crowdsourcing and providing benchmarking tools to help you "find your worth" through open feedback and benchmarking. Transparency has been very healthy for business, and it has spawned a new set of pulse surveys, AI-based analysis and recommendation systems, and culture assessments throughout the marketplace. This tech is available from startups, ERP vendors, Talent management systems, and can be found embedded in the new systems.

5) New variety of learning tools: These include the "experience platforms," a new breed of "micro-learning platforms," modernized Learning management Systems or LMS, and new AI-based systems to recommend learning, find learning, and deliver learning. Virtual Reality-based learning is now alive and well, and is expectd to see smarter and smarter technologies to help us find "just what we need" along the lines of performance support that lets employees publish and share content without any major effort.

6) Innovation in the Recruiting Market: Recruitment is the largest marketplace in HR and this technology the most dynamic and innovative. Companies spend billions each year on recruiting and it has become an escalating war for employment brand, candidates, candidate experience, and strategic sourcing. High volume recruitment (hospitality, services, healthcare,retail) is being automated by chatbots and other new tools; skilled job recruitment is being revolutionized by open sourcing tools, more automated recruitment management or applicant tracking systems, and better assessments by use of video cultural tools has become developed and popular.

Today more and more jobs are “hybrid” and rapidly changing, so the new of tools are needed to find people with the right capabilities and learning skills. And diversity is now a core part of recruiting, with new technology to help remove bias from job descriptions and reduce bias in interviewing.

7) The Wellbeing Market Is Exploding

HR technology, content, and tools for wellbeing are likely be the next “big thing” in business

8) People Analytics

Growth of cloud platforms is facilitating People analytics - a data-driven approach to managing people at work. For the first time in history, business leaders can make decisions about their people based on deep analysis of data rather than the traditional methods of personal relationships, decision making based on experience, and risk avoidance. is now making it explode, and it’s easier than ever to build a manager-level dashboard that helps your teams understand what they can do to make the work experience better. People Analytics as the lynchpin of success for HR in the next few years.

9) Intelligent Self-Service Tools

Self-service, employee experience platforms are bringing case management, document management, employee communications, and help-desk interactions as one integrated architecture- serving as a dynamic service center.

AI –Artificial Intellgence is the new frontier fast emerging and disruptive comprising of smart chatbots intelligent agents, and fun games that make training, expense reporting, time tracking, and almost every other HR function easy.

10) Innovation within HR Itself

Incredibly rapid growth in innovation projects within HR teams who have become inventors of models in PMS, learning strategies, new ways to reduce bias, and new techniques to recruit and coach people. And are also selling this to others. [3] In 2019 they (Deloitte) predicted that an intensifying combination of issues was forcing the organization to adopt a human face.And that is where the future of HR will be.

Speaking to *The Wall Street Journal* in an exclusive interview, head of the International Monetary Fund, Christine Lagarde, said: "where a breakthrough in technology, a significant innovation, creates fear and anxiety, does eliminate jobs. But by the same token, new jobs are created. And this is most likely what we are going to see. We are transitioning into digital beings and this will mean the creation of a future about which "we have no idea".

Machine learning, artificial intelligence, and augmented reality are just three examples of innovations that will significantly disrupt our way of life both at work and at home.Many of today's current jobs will be replaced, or at minimum augmented by advanced technologies. As the stewards of culture, HR can play an active role in shaping the organisations of the future and embrace the workplace impacts of technology.People want to work how they live – intuitively, real-time, and in the moment. HR strategies, processes, and tools must provide that experience.

R E F E R E N C E S

1. Cloud computing is the on-demand availability of computer system resources, especially data storage and computing power, without direct active management by the user. The term is generally used to describe data centers available to many users over the Internet. Large clouds, predominant today, often have functions distributed over multiple locations from central servers. If the connection to the user is relatively close, it may be designated an edge server. They may be limited to a single organization (enterprise clouds), or be available to many organizations (public cloud).

2. https://wwwhuffingtonpost.co.uk/2014/01/17/rise-of-the-machines- See also THE FUTURE OF EMPLOYMENT: HOW SUSCEPTIBLE ARE JOBS TO COMPUTERISATION? Carl Benedikt Frey and Michael A. Osborne, https://www.oxfordmartin.ox.ac.uk/September 17, 2013

3. https://www2.deloitte.com/content/dam/Deloitte/us/Documents/human-capital/us-hc-2018-hr-technology-disruptions.pdf

Chapter 3

WHAT DISRUPTION REALLY MEANS FOR US (AS ARCHITECTS) ?

DISRUPTION, DEFINED.

Noun: disruption; disturbance or problems that interrupt an event, activity or process.

Introduction: "disruption" is the GuruMantra of the movers and shakers of the world. In fact, disruption has become one of the most clichéd words in Architecture. "Disruption" describes a process whereby a smaller company with fewer resources is able to successfully challenge established incumbent businesses. Specifically, as incumbents focus on improving their products and services for their most demanding (and usually most profitable) customers, they exceed the needs of some segments and ignore the needs of others. Entrants that prove disruptive begin by successfully targeting those overlooked segments, gaining a foothold by delivering more-suitable functionality—frequently at a lower price. Incumbents, chasing higher profitability in more-demanding segments, tend not to respond vigorously. Entrants then move upmarket, delivering the performance that incumbents' mainstream customers require, while preserving the advantages that drove their early success. When mainstream customers start adopting the entrants' offerings in volume, disruption has occurred.

In business theory, a disruptive innovation generates a new market and value network and eventually upsets an existing market and value network, displacing established market-leading firms, products, and alliances.(e.g., the lower-priced, affordable Ford Model T, which displaced horse-drawn carriages).[1]

Other Types of Innovation

Sustaining

An innovation that does not significantly affect existing markets. It may be either:

1) Evolutionary
   An innovation that improves a product in an existing market in ways that customers are
   Expecting-e.g fuel injection for gasoline engines, which displaced carburetors.
2) Revolutionary (discontinuous, radical)
   An innovation that is unexpected, but nevertheless does not affect existing markets (e.g., the first automobiles in the late 19th century, which were expensive luxury items, and as such very few were sold)

The origin of the term "disruption" comes from Clayton Christensen's 1997 book *The Innovator's Dilemma* [1], where Christensen introduced the idea of "disruptive innovation" using this phrase as a way to think about successful companies forestalling their unstated or future needs not just meeting customers' current needs. Disruption is synonymous to "interruption," which has a largely negative connotation but this theory worked to explain how small companies with minimal resources were able to enter a market and displace the established system. In 2000 [2]when it was first introduced, it turned out to be a powerful concept, In an update in 2015, he further classified what it encompassed:

> "First, disruption directs you to look in places you might otherwise ignore. Christensen's research shows that disruption often starts at a market's edges. Sometimes that is in relatively undemanding market tiers, such as how mini mill manufacturers started in the rebar market. Disruption also takes root with customers that historically were locked out of a market because they lacked specialized skills or sufficient financial resources to consume existing solutions. Sometimes the place to look is in physical locations where consumption was historically difficult if not impossible. Finally, fringe markets like hackers or students can put up with the limitations that often characterize early versions of disruptive ideas."[3]

Christensen's research shows that disruption often starts at a market's edges. Sometimes that is in relatively undemanding market tiers, such as how mini mill manufacturers started in the rebar market. Disruption also takes root with customers that historically were locked out of a market because they lacked specialized skills or sufficient financial resources to consume existing solutions. Sometimes the place to look is in physical locations where consumption was historically difficult if not impossible. Finally, fringe markets like hackers or students can put up with the limitations that often characterize early versions of disruptive ideas.The market for transportation essentially remained intact until the debut of the lower-priced Ford Model T in 1908. The mass-produced automobile was a

disruptive innovation, because it changed the transportation market, whereas the first thirty years of automobiles did not. The business environment of current market leaders does not allow them to pursue disruptive innovations when they first arise, because they are not profitable enough at first and because their development can take scarce resources away from sustaining innovations (which are needed to compete against current competition). Disruptive innovations tend to be produced by outsiders and entrepreneurs in startups, rather than existing market-leading companies.

A disruptive process can take longer to develop but once deployed in the market, it achieves a much faster penetration and higher degree of impact on the established markets. They can also disrupt complex systems, including economic and business-related aspects. As an example in Architecture, the first big disruption to the architecture industry was the WeWork model because architecture firms were not set up to compete with the WeWork model. Architecture is a product oriented business except now WeWork is providing a service on top of that product. WeWork is an American commercial real estate company that provides shared workspaces for technology start-ups and services for other enterprises. As of 2018, in just 8 years, WeWork managed over 4 million square metres. They design and builds physical and virtual shared spaces and office services for entrepreneurs and companies. At one time, WeWork had more than 5,000 employees in over 280 locations, spread across 86 cities in 32 countries. WeWork purchases real estate space—sometimes just a floor or two in an office building—and transforms it into smaller offices and common areas. It rents desks to individuals or groups who want the benefits of a fully stocked office without the expense of a full office. Members include independent freelancers and remote workers who need an occasional office away from home. They may want unlimited Wi-Fi to focus on a deadline. Other customers are small businesses with multiple employees who need a consistent place to work, have meetings, and build their budding empires, but without the high cost.

Today change can be so rapid that it exceeds human capacity to readily adapt to it. An understandable response is to find it overwhelming and disorienting. “Yet every day presents new reasons for amazement and optimism. In field after field, revolutionary innovation unimaginable even a decade ago has become the new normal. The blistering pace of change frustrates attempts to assess its impacts. Does change mean progress (a better tomorrow) or disruption?”

Age of Accelerations in the architectural profession:

Is the architecture, engineering, and construction (AEC) industry being disrupted? Are AEC firms driving innovation that enables them to thrive in a disruptive and highly competitive business environment? The AEC industry is being transformed and Architectural disruptions set to alter the technology industry. Emerging technologies are on pace to disrupt technology architecture in the next three to five years.

The word "Design" has always been both a noun and a verb; it deals with both the things we make and how we make them. Despite the creative nature of architecture, or perhaps because of it, business models within the industry have long remained static. Architecture has not produced any disruptive new business model. However with technological advances architecture might finally be ripe for disruption. There is plenty of evidence for the Age of Accelerations in the architectural profession, from how we build to the tools we use and even the services we provide. Less the handiwork of carpenters and masons, increasingly buildings are fabricated assemblies installed by technicians. Virtual reality and 3D printing are supplanting pencil sketches and chipboard models. Established business models are becoming too confining in an increasingly entrepreneurial world. New Architecture employs robotics that 3D print building-scale structures to emulating nature's construction techniques. Super-realistic computer-generated imaging has the power to transform our relationship with clients and the public. Using powerful visualization tools, even people who "can't read plans" can experience buildings as they are designed. Fear of the unknown can be eliminated. Engagement in and understanding of architectural thinking can be taken to new levels.

No technology remains fixed. Technology starts, develops, persists, mutates, stagnates, and declines, just like living organisms. The evolutionary life cycle in Architecture too occurs in the use and development of any technology. Remember the days when we as children looked at drawing as paper, pencil and Scales. Never heard of CAD/CAM or REVIT. Another example, designers and builders use Building Information Modelling (BIM) technology in different ways and the technology is impacting the market differently. At its core, disruption is driven by innovation. Innovation comes from innovative people who possess a skill known as 'associative thinking.' The World Bank's 2019 Report examines how technology shapes the relative demand for certain skills in labor markets and expands the reach of firms - robotics and digital technologies, for example, enable firms to

automate, replacing labor with machines to become more efficient, and innovate, expanding the number of tasks and products. This explains how disruptive technology, through its requisite support net, can dramatically transforms industry. Negatively too.

While architects have traditionally seen themselves primarily as creators of static objects called buildings, buildings are never really static. They are teeming with human activity, constantly changing and adapting to the needs of their occupants. Disruptive technology opens up all kinds of opportunities for architects and engineers to be the designers of processes as well as places. New technology will allow buildings and occupants to interact in more ways than currently feasible. Sensors will track occupancy and movement, program elevators, monitor water usage, adjust the lights, monitor safety conditions and even remind us when and how to take care of routine maintenance. In short, buildings will and are programmed to be as responsive and interactive as we would like, and just like driverless cars, they will become more so over time. Our space will be changed by technology. Personal space is being replaced by communal areas that can be used in a variety of different ways, day and night. Architectural media is one such disruption. See that many new offices are now organized around team-based interaction, with very few, if any, private offices, lots of collaboration space, and highly sophisticated IT and AV systems. Subsequent changes will enter into domains of floor plates, column grids, ceiling heights, lighting, acoustics, and furniture, as well as colour, texture, and basic planning layouts. There has been a dramatic decrease the average square footage per employee. WeWork example above is one typical of such. Just as Bank buildings have been termed obsolete by ATMs Cards and Internet on line financial services. As the ways we use offices, hospitals, classrooms, schools, and stores change, many existing structures will need to be re-tooled or replaced entirely. New buildings will be built to different standards, designed to fulfil a wide variety of functions over their useful lives, thus putting a premium on “downstream design.” Since the lion’s share of a building’s actual ownership cost relates to operations and maintenance rather than initial capital outlay, architects and engineers will be asked to design for the entire life cycle of a building with the expectation that it will likely be re-purposed several times over. In addition to aesthetics, modelling building performance will become a standard part of the design process, as will tracking actual post-occupancy performance. All this changes the nature of design in a fundamental way, shifting it from a cost to an investment. In the process, tremendous new opportunities will open up, including:

Residential: New apartment and condominium construction are "micro-units" include full service amenities such as business centres, meeting rooms, health-clubs, swimming pools, and even party rooms for social functions, which can be accessed and paid for on an as-needed basis.

Hotels: With on-line booking, instant check-in, and automatic billing, reception desk have become Obsolete? Open bath/bedroom arrangements and enhanced business services, lobby spaces turning into clubs traditional room design configurations are changing to incorporate all these pre-programmed features. Prosumption [4] will address individual tastes prior to arrival, including making sure that the room is well stocked with your favourite drinks and snacks.

Retail: Majority of retail activity could very well morph into cyberspace, with most goods ordered from on-line catalogues and delivered via express mail.

Schools: Online schools and seminars- electronic chat rooms with real-time digital interaction with the faculty.

Libraries: online- even today

Laboratories

Will become humanless-manned by Robots who will do the analysis- which in any case even today is done by sophisticated analytical machines with human merely loading the operations

Hospitals

New regulations require that reimbursement will be based on outcomes rather than traditional pay-for-procedure- If you fail to get well you don't pay or pay less- so hospitals will move to lower cost, more easily accessible settings, with a higher percentage of outpatient care, laboratory, diagnostic and imaging services provided on a stop-and-shop basis. Older hospitals will need to be thoroughly renovated or demolished and replaced.

The design and construction process itself will also be disrupted, with complex structures modeled and optimized by algorithms at lightning speed, 3-D printers both in the office and on the construction site, new nano-tech and totally biodegradable materials that eliminate waste, off-site prefabrication, and construction robots that will do difficult tasks on a 24/7 basis much more safely and efficiently than human labor, greatly accelerating construction schedules.And just like the steam engine and transcontinental rail, in just a few years all of this will seem like yesterday's news.(See Chapter 2)

As a hypothetical question, how could an architecture firm operate in this way? The easy part of this experience ecosystem is design, it is inherent to the architectural process. The harder part would be building out a network of experiences that can inform and build off each other at a scale at which this network would actually be useful. *This would also provide architecture firms with an ever growing pool of knowledge with which to make informed design decisions and continue to craft client experiences even after construction stops.*

R E F E R E N C E S

1. The Innovator's Dilemma, Clayton Christensen, Harvard Business Review Press, 1997.

2. Meeting the Challenge of Disruptive Change, Clayton M. Christensen,Michael Overdorf, Harvard Business Review, March–April 2000

3. How Understanding Disruption Helps Strategists, Scott D.Anthony, Harvard Business Review, November 2015. See also What Is Disruptive Innovation? Clayton M. Christensen, Michael E. Raynor, Rory McDonald, Harvard Business Review, December 2015

4. See our article on "Prosumption in Architecture" in academia.edu

Chapter 4

HR IN PROJECTS

When you look at a list of key HR competencies, one thing that often is lacking is a good set of project management skills. I see Human Resource Management as a core part of what we have to do.

HR Project Management: The Ultimate Guide, Ben Eubanks

A B S T R A C T

HR project managers work across many fields and sectors to ensure that human resources programs support the long-term goals of not only an HR team but the Project team as well and equally importantly so. HR person in this position and often navigates the areas of customer service and employee development overseeing a variety of administrative programs and functions. It requires juggling many projects with the needs of many individuals. These self-motivated leaders are also frequently tasked with developing new HR programs and initiatives.The disruption in this industry apart from what we have discussed in Chapter 1 will be the additional focus on the PM.

If project human resource management describes the processes that enable the project manager to organize and lead the project team, then a subset of the project team is the project management team, responsible for leadership activities in each of the five major process groups. Part of the role of the project manager in managing the project team is to influence the team when human resource factors

may impact the project, and to ensure professional and ethical behavior at all times when conducting project activities.When developing the human resource plan, the project manager needs to understand what enterprise environmental factors and organizational process assets can affect the outcome of the project.The next big disruption in this area will be the increased importance given to the zpm not only to navigate the project but to identify disruptive trends and technologies and adapt to the new digital landscape such as 3D printing of Materials and Digitally compassed project sites.

Enterprise Environmental Factors - these elements need to be addressed thoroughly, especially when it comes to organizational and political issues. Remember the definition of a stakeholder? It is anyone that can be positively or negatively impacted by your project. If there is a negative impact on a stakeholder, that stakeholder may have a completely different agenda and may work against successful completion of the project. The project manager's job is to uncover any alternative agendas and work with stakeholders to ensure their needs are met.

Organizational Process Assets –the elements that will assist the project manager are standardized matrices such as standardized roles and responsibilities as well as any documented and repeatable processes. Usually an organization will have established templates and tools (e.g. progress reports, executive dashboards, change request forms, etc.) that are subsumed inside the organization's PMIS. Historical data from previous projects and organizational structures that have been successful on previous projects can serve as guidance for the project manager.

Project based knowledge: Project actors bring with them much of the knowledge created within projects, and new knowledge created within these projects is embodied in the tacit experiences of these actors.They are also effective vectors for the transfer of knowledge developed during the projects.It is important for thr Organization to ensure that this transfer of knowledge is effective if it wants to ensure that learning is spread out within the organizational realm and does not remain a simple local knowledge tacitly embodied by some individuals. In so doing, the company profits from their contributions. Indeed, these ideas can have a significant impact on the organization only when they are largely diffused rather than held by a limited number of individuals.

Human Resource Roles: The key responsibilities of each group are listed below:

The Project Sponsor

- Protects the project from external influences
- Provides funding
- Approves the charter and PM Plan
- Sets priorities between projects
- Identifies Project Manager and authority level
- Approves or rejects changes
- Formally accepts deliverables or product of project

The Stakeholders

- May have PM plan signoff responsibilities
- Validate Scope and deliverables
- May be part of the change control process for approvals/rejections
- Provide requirements

The Line (functional) Manager

- Provides project resources
- Participates in initial planning
- Manages project activities that fall to their area
- May address team member performance with the project manager

The Project Manager

- May contribute to writing the project charter
- Is responsible for all aspects of the project:
    - Project management planning
    - Communications to stakeholders
    - Change management planning
    - Creating all needed management plans (scope, time, budget, quality, communications, HR, risk and procurement)
    - Using metrics to measure project progress and implement changes or corrections when needed
    - Proactively addressing potential problems
    - Possesses the authority to accomplish the work of the project

- Resolves variances to the project management plan with the team
- Regularly and proactively addressing project risks with the team
- Ultimately responsible for project success or failure

Developing the human resource plan includes the major headings listed below, along with a brief description of what is expected for each.

Roles and Responsibilities - can be assigned to a person or group. This defines roles, authority, responsibility, and competency. These individuals or groups can be within or outside the performing organization. The roles described for the project may not have a direct analog to a position within the organization. Thus it is the project manager's job to identify resources that can take on the responsibilities of the particular role needed for the project. These roles can be documented in a responsibility assignment matrix (RAM) in the form of a RACI chart (responsible, accountable, consult, inform)

Org Charts - an organizational breakdown chart (OBS) is critical for identifying management hierarchies in the project and identifying potential escalation paths should there be issues that the project manager has not been empowered to resolve. In a matrix organization this becomes a critical factor, as it may identify functional managers from whom the project manager secures resources for the project. The org chart also works hand-in-hand with a roles and responsibilities chart, in that it will identify an unambiguous owner for each work package in the project.

Staffing Management Plan - this plan describes how human resource requirements will be met for the project. The plan can be formal or informal, detailed or general, depending on the project needs. The staffing management plan is continually updated during the project and usually includes the following elements:

- Staff Acquisition - identifies when specific resources roll on or off the project and the skill levels required of those resources
- Resource Calendars - identifies when staff acquisition activities should begin as well as staff availability and hours available from a particular resource

- Staff release plan - defines when resources are released from the project so that those resources are no longer charged to the project
- Training - may be required if the performing organization is dealing with a new or untried technology. It is also beneficial in that it will help team members attain certifications that support their ability to meet project requirements. In PMI's view, training is not used as a 'perk'.
- Recognition and Rewards - the idea of a recognition and reward system is that it tends to promote desired behavior on the project.
- Compliance - this involves compliance with government regulations or union contracts in addition to established human resource policies
- Safety - these include methods and procedures that are designed to protect team members from the potential safety hazards. These elements are not only included in a staffing management plan, but can also be included in the risk register

A. __Plan human resource management

B. ___Acquire project team

C. ___Develop project team

D. ___Manage project team

A. The process of improving competencies, team member interaction, and overall team environment to enhance project performance

B. The process of identifying and documenting project roles, responsibilities, required skills, reporting relationships, and creating a staffing management plan

C. The process of tracking team member performance, providing feedback, resolving issues, and managing changes to optimize project performance

D. The process of confirming human resource availability in obtaining the team necessary to complete project activities

HR project managers work across many fields and sectors to ensure that human resources programs support the long-term goals of not only an HR team but the Project team as well and equally importantly so. HR person in this position and often navigates the areas of customer service and

employee development overseeing a variety of administrative programs and functions. It requires juggling many projects with the needs of many individuals. These self-motivated leaders are also frequently tasked with developing new HR programs and initiatives, including training seminars.

HR project managers possess exemplary communication and analytical skills as well as leadership and relationship management expertise. Employers usually seek candidates with a bachelor's degree in human resources or a related field, around four years of experience, and the following skills:

- Program directing – HR project managers direct and coordinate programs and initiatives for the HR department and the company in general, so they must be able to organize and direct people
- Research skills – it's important for HR project managers to research and identify trends in the field and stay current on policies and procedures. They also need the ability to distill this information and explain it to others
- Personnel management – collaborating with others in the HR department requires leadership skills. HR project managers must be comfortable running meetings, seminars, and courses
- Communication skills – overall, HR project managers are strong communicators both in person and through emails, documents, and social media
- Time management – the HR project manager often handles many different tasks for multiple projects. A talent for juggling different duties efficiently and effectively is important for anyone in this role

HR Project Manager Duties and Responsibilities: Regardless of which industry these individuals work in, HR project managers plan, direct, and implement a variety of HR programs. Accomplishing this overall goal requires some key tasks, including the following:

Develop HR Training Programs

HR project managers create a variety of training programs and courses for the HR department as well as for the company as a whole. For example, they might create seminars related to HR policy for the company. These managers routinely direct and manage seminars, trainings, courses, and more.

Research and Prepare Reports on HR Trends

HR project managers need to know about HR trends as well as trends and specific policies related to their company. This often requires conducting research and staying current on news. In addition, the HR project manager will need the skills to compile this information in a way that's readable and accessible.

Create and Revise HR Programs

HR project managers spend much of their time creating and revising HR programs and policies. This can include updating existing policies as well as creating new ones. The ability to create documents and communicate ideas effectively is essential, as HR project managers relay this information to colleagues in the HR department and in other departments.

Coach Department Heads

While HR project managers don't usually have any supervising responsibilities, they often function as a mentor or coach to others in the company. This duty can include providing information and mentorship on how to implement and follow HR policies.

Represent the HR Department

The HR project manager often acts as a representative of their respective company's HR department. This can mean attending seminars and courses to ensure the department is up to date. It also means the HR project manager should be comfortable communicating with new people in professional capacities. Project human resource management includes the processes that organize, manage, and lead the project team. The following processes and the primary goals of Project human resource management are defined below:

- Develop human resource plan. Goal: human resource plan
- Acquire project team. Goal: project staff assignments
- Develop project team. Goal: team performance assessments
- Manage project team. Goal: updates

> "To win the marketplace, you must first win the workplace." -Doug Conant, Campbell Soup Company's long running President and CEO until 2011

CHAPTER 5

The Role of Human Resource Management in the Knowledge and Application of Project Management and its Tools

The "P" in PM is as much about 'people' management as it is about 'project' management."

– Cornelius Fichtner

A B S T R A C T

Tools that help in managing Projects form a part of what is known as Enterprise Software which are a collection of computer programs that have common business applications, tools for modelling how the project or its parts works, and development tools for building applications unique to the organization. These tools are intended to solve an enterprise-wide problem, rather than a departmental problem and improve the projects productivity and efficiency by providing support functionality. Some of these tools are considered in this paper.

Project management tools are usually defined by the different features offered. They include, but are not limited to: Planning/scheduling - Project management tools allow you to plan and delegate work all in one place with tasks, subtasks, folders, templates, workflows, and calendars. So, what is a project management tool? Simply put, it is software to help organize work and collaborate with colleagues on projects.

Project management tools are aids to assist an individual or team to effectively organize work and manage projects and tasks. The term usually refers to project management software you can purchase online or even use for free.

According to the National Standard Competencies of Project Management[1] "Project management is the planning, organizing, monitoring and controlling of all aspects of a project and the management and leadership of all involved to achieve the project objectives safely and within agreed criteria for time, cost, scope and performance/quality". However, the range of project management tools is growing, while the attention is paid to the tools that help implement the basic project parameters effectively, i.e. the project objective, quality, period and budget, and minimize the related risks, but also the tools that make it possible to manage implementation of more parallel projects (project programs or portfolios).

Together with the trend of change and innovation implementations in the form of projects, what is also more and more important in practice is the knowledge and application of project management and its tools. The fact is that the higher the rate of the project management expertise, the higher the probability of successful completion of such projects by its application in practice and the higher their effectiveness. However, the level of utilization of project management and its tools is different in different countries, national economy sectors or organization types.

Whom one hires and how they manage them determines the success and failure of every project. Other factors seem to be secondary in comparison to this one. HR is indispensable for a business if it is to thrive because nailing a sales pitch and successfully spreading the word about one's product won't do them much good if there are no people in place to meet customer demand.However, managing employees and tasks they are appointed to isn't a piece of cake. Fortunately, there is plenty of project management tools which may help one to coordinate their employees. Some of the best can be found below:

1. Project Human Resource Management. The Human Resource Management Plan

Human resource management is a plan to organize and lead the project team. Human resource plan process describes how the project manager will manage the staffs, team building, assess and improve the project team. It includes project organization charts and the timetable for staff acquisition and release, and may also include identification of training needs, team-building strategies, recognition programs, compliance considerations and safety issues.

2. Inputs to develop Human Resource Management Plan

Activity Resource Requirements: It provides information on what resources will be needed to complete the work on each of the activities within the project. When carrying out the time

management planning processes, general estimates were created for human resource needs, and they will now be more thoroughly evaluated and estimated within this process.

Enterprise Environmental Factors: This will give information about organizational structure and infrastructure of company. These provide vital background when performing the develop human resource plan process

3. Organizational Process Assets: These will include aspects such as examples for previous similar resource project plans, organizational policies procedures and guidelines with regard to human resources, or special corporate or competences for the provision of key knowledge skills and experience for the project.

Tools and Techniques of HR Plan:

I) Organizational Charts

Organizational charts are the graphical diagrams to explain the authority and reporting lines in the project. Human resource management plan is the staffing management plan it describes about when the staff will recruit in the project, how the staff will be trained and when the staff will be relived from the project.

II) Matrix

The type which is used most often is called the responsibility assignments matrix (RAM). These can be shown as a table with the left hand column listing the various work packages, and the remaining columns describing the various roles.

III) Text

Text is a simple document which describes the position role within the project, what their responsibilities will be, what the job involves and the qualifications needed to fill such a position. This particular format is particularly useful when recruiting appropriate individuals for roles within the project.

IV) Networking

This is the second main outputs of the human resource plan process, and describes the communication process with others within your network of contacts. The main purpose here is to gain an understanding of the political and organizational forces that may influence the project.

V) Organizational Theory

Teams or groups behave differently than when they work as an individual, and it is vital that the project manager understands how such teams behave. There have been various studies and tools

developed to help understand organizational theory, and it is important that the project manager up next themselves familiar with these as they will have a huge positive impact on the project in helping it to be successful.

VI) Expert Judgment

When developing the human resource management plan, expert judgment is used to list the preliminary requirements for the required skills. Assess the roles required for the project based on standardized role descriptions within the organization. Determine the preliminary effort level and number of resources needed to meet project objectives. Determine reporting relationships needed based on the organizational culture. Provide guidelines on lead time required for staffing, based on lessons learned and market conditions. Identify risks associated with staff acquisition, retention, and release plans. Identify and recommend programs for complying with applicable government and union contracts.

Develop human resource management plan outputs

VII) Human Resource Plan

Project management plan provides guidance on how project human resources should be defined, staffed, managed, controlled, and eventually released.

The structure of this important document consists of:

o Roles and responsibilities

o Organization charts

o The staffing management plan

VIII) Roles and Responsibilities

Roles and responsibilities explain each role that is needed on the project, provide their title, and describe their level of authority, responsibilities, and their knowledge, skills and level of competency needed in order to carry out their role within this project.

IX) Project Organization Charts

Organization chart is a graphic display of project team members and their reporting relationships.

X) Staffing Management Plan

Staffing management plan is a part of the human resources plan within the project management plan and describes when and how human resource requirements will be met. It includes:

• The staff acquisition processes

• A timetable for staffing requirements

• A description of how and when staff will be released from the project
• Staff training and development needs
• Health and safety policies
The TOOLS to make all the above 10 items possible or at least as many as possible are listed below.

HeySpace
If Slack and Trello had a baby, it would be HeySpace. It's one of the best tools for sales because of it's functionalities and ease of use. HeySpace is a task management software with chat. It helps to communicate and collaborate with clients, and with other team members and departments. People can manage workflow and monitor the progress of works always up-to-date.
HeySpace allows your sales team to eliminate two or even three different tools – task management software, project management software, and communication software since it combines the key features of these three. No more switching between different apps! You have everything in one place, easy to access and easy to use.
Main features:

- Workspaces – you can create different workspaces for different clients, teams or departments
- Group and individual chat
- Converting conversation into task
- Adjustable tasks – you can *set date, assign people to it, add tags, description, files, comment on it, add estimates, copy task*
- Calendar integration and Google docs attachments
- Small features for your convenience: *status, text editor, attaching files, mentions, history of changes*
- Notifications
- Kanban board with tasks
- Hangouts calls
- TimeCamp time tracking integration
- Available as Web, mobile, and desktop app

The other three top-rated project management software solutions for HR are:

- Basecamp
- Mavenlink

- Paymo

2. Basecamp: Onboard and train employees faster with a resource centre

Basecamp is a software tool that combines project management and team collaboration. HR professionals can leverage the tool's file management and master calendar features to create resource centres for faster employee on-boarding.

Profile pages can be created for new hires where important documents such as employee handbooks, medical benefits forms, holiday lists, and payroll info can be stored. And a to-do list of priority tasks for new hires, such as filling out forms, to complete within the first few days of hiring can be created. Additionally, the resource centre serves as a central location for new employees to download, fill out, and submit forms digitally. This way, employers and new hires save a lot of time, which would otherwise be spent writing and sending multiple emails for each task.

HR teams can also add to-do items to a new hire's calendar using the master calendar feature. This feature automatically alerts new hires about important meetings such as explanation of benefits, upcoming training, or even team parties and events. Other interesting points are:

- Ease of document management: The file management feature that creates an archive of important documents to share with colleagues.
- Streamlined team communication: Users mention that the tool stores all communication in one place, saving them time that would otherwise be spent on digging through email threads.

Basecamp is suitable for small HR teams that want to store important files and documents in a centralized location for all employees to access easily. One can create as many new hire profiles as you want. But it is not ideal for large and distributed teams where employees need to connect with each other via real-time chat or videoconferencing.

3. Mavenlink: Manages HR employee workloads better with resource management

Mavenlink is project management software that offers resource planning, resource utilization reports, and forecasting capabilities. Its resource utilization reporting feature can help HR managers understand which employee is doing what, at any given time. View details such as time spent on recruiting, onboarding, managing payroll, and ensuring compliance. These reports help managers identify issues, such as instances of over-allocation of work, and set realistic objectives and targets.

HR managers can also use Mavenlink to leverage the skill sets of different employees and ensure they're adequately staffed with the resource planning and scheduling features. For instance, allocate administrative tasks such as creating job ads and handling paperwork to a more junior HR associate, while a senior HR employee can handle more complex tasks such as compensation management and training.

The master planning sheet also helps you understand resource availability by giving you an idea of how much work an employee can handle in a day. View details of upcoming events that will take up your employees' time, e.g., team meetings, paid time off, and public holidays.

- Different kinds of reports, such as resource allocation, resource utilization, and resource forecasting, which help form a clear picture of employees' capacities can be easily created. This allows for better management of resources at all levels.
- Awareness of task dependencies with Gantt charts: Gantt chart helps in reviewing and adjusting any bottlenecks that employees face while executing tasks. Mavenlink is suitable for midsize companies and enterprises (with more than 900 employees) that are expanding to multiple locations and need to ramp up their hiring. More hiring means that these businesses need a resource management tool for HR employees to effectively manage the increasing workload.

Despite this, small businesses can also use this software. If you're thinking of using Mavenlink, negotiate with the vendor over the price. Small businesses should factor in their current budget and the estimated volume of usage by their employees before making a decision.

4. Paymo: Track employee time and estimate compensation

Paymo is a project management solution that offers time-tracking functionality, which is useful for creating employees' hours worked reports.

The tool offers both manual and automatic time-tracking. Manual time-tracking allows employees to digitally record their login and logout times. Automatic time-tracking, on the other hand, runs in the background of a device and records onscreen activities. For instance, it tracks the time an employee spends browsing a website, reading emails, or creating a document.

Automatic time-capture is useful for tracking hours for freelancers and could be used to calculate compensation based on the actual time they spend on a project. Conversely, if your small business does project-based work for clients, this feature can help create billable hour reports to benchmark salaries for your employees.

One can run the time-tracking apps on different devices and platforms and collect data from employees working on desktops, laptops, and even iOS or Android mobile devices.It lets you visualize all this data in the form of online timesheets, so you can quickly understand the total employee work hours and financial details such as billed and unbilled tasks.

- Automatic time-tracking on different devices: Users like the convenience of the built-in functionality for automatically tracking employee time on different devices such as desktops, laptops, and mobile devices.
- Ease of invoice management: Reviewers mention that the tool's reusable invoice templates make it quick and easy to bill clients. They only need to add a link to the payment option, such as PayPal and Stripe, in the invoice.

Paymo doesn't have a user limit in its paid plans, which means that different small business HR teams can use it at no additional cost. They can continue using it as they grow in size to track employee time, especially that of remote workers and freelancers.

HR teams can also use the billable hours functionality to calculate compensation.

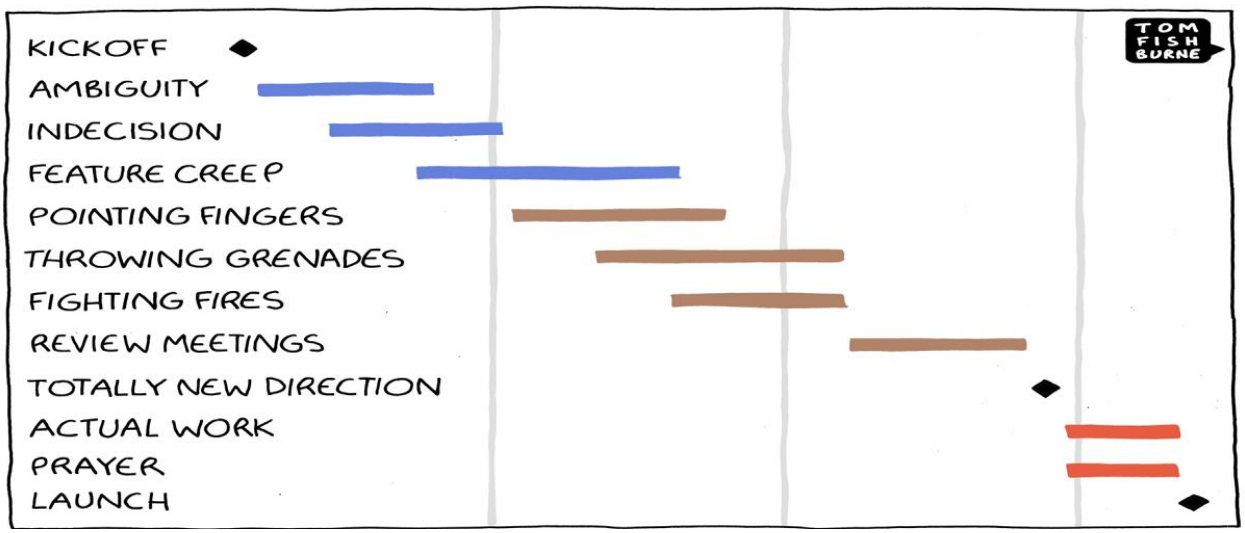
5. Other software tools for project HR are
    1. Applicant Tracking Systems
    2. Video Interview Software
    3. Pre-Employment Assessment Tools
    4. On-boarding Software
    5. Performance Appraisal Software
    6. Compensation Management Software

R E F E R E N C E S

1. The European based International Project Management Association (IPMA)
   The Australian Institute for Project Management (AIPM)
   The Japanese Engineering Advancement Association of Japan (ENAA) together with the Project Management Professionals Certification Center (PMCC)

CHAPTER 6

HR INTERVENTIONS IN PROJECTS



.

The principle behind resource management is to invest in resources as stored capabilities, then unleash the capabilities as and when needed. On the other hand, human resource with the right attitude and correct behavior is considered to be the most important asset in an organization. [1]

"Our point of view is that we need to stop refining concepts for HR that were designed for the world of today and yesterday. The world of tomorrow is going to be so much different, that current concepts (that very often are not effective today) will be misaligned in the world of tomorrow. And if we keep refining them, our profession will become increasingly irrelevant. We do not need an evolution, we will need *a disruptive revolution* or re-imagination of our profession to stay relevant for the years to come. " Says the Human Resource Consulting Form Kennedy Fitch in its 2019 report.

The major human resource support activities relevant to project management encompass the broad spectrum of what Human Resource Management actually comprises of - namely conducting the

recruitment, on boarding, training process, managing and measuring performance, compensation and rewards, managing leaves, enforcing discipline, and ensuring legal compliance. Organizations executing projects show reluctance towards embracing new human resource management techniques due to widespread use of traditional HRM. However, here we will examine what new techniques we adopted to ensure project success of our International Zoo project in Central India. The 10 disruptions coming forth in the HR arena are predicted to be:

1. A Massive Shift From "Automation"to productivity
2. Acceleration Of HRMS And HCM Cloud Solutions, But Not The Center Of Everything
3. Continuous Performance Management
4. Feedback, Engagement, And Analytics Tools
5. Reinvention Of Corporate Learning
6. The Recruiting Market Is Thriving With Innovation
7. The Wellbeing Market Is Exploding
8. People Analytics Matures And Grows
9. Intelligent Self-Service Tools
10. Innovation Within HR Itself

(HR Technology For 2018: Ten Disruptions Ahead, Josh Bersin,2017)

In the context of that what lies ahead for Project HR

Project Planning

Of all the resources required to execute projects, human resources is the most critical during the project planning stage which is the start off of any project. Planning involves the project management's plan to the owner of assignment provider about how to get on with the project and bring it to fruition. Here elements of the project, involving which activities and schedules for work completion are defined. During this stage, project scope and resources available are also crystallized by the project managers and the project owners.Resources such as land, money, materials, machinery, and others are known as passive resources. Human resources on the other hand are the dynamic ones and decide the success or failure of the project depending on who and how the materials are moved by competent humans taking the work to project execution stage.

In planning we determine the kind and type of people required for project execution, how they are to be got on board and strategies for allocating and managing the available workforce. In the project domain, the project landscape is fast-paced, competitive and full of impromptu decision taking. This puts the onus on speed and innovation. The project cycle is shorter needing quick decisions leading to frequent changes in direction and project requirements- very much in an environment of uncertainty. Human resource need to be light on their feet. Human resource strategies in project management field must result in tactics that provide the:

1. Right Human Resource,
2. in Right Amount,
3. And at the Right Time.

The urgent people-related issues at this stage also involve ensuring the selected employees' fitment, team building and formation, and answer the question of how to endow the team by training and other interventions, defining roles and responsibilities and managing culture. To Acquire the Project Team human resources have to be employed for the identification, evaluation and employment of staff for the execution of the project plans and activities. This process guides in the assignment and selection of responsible individuals to further promote project success. Once the HR process is set in place- this allows the project manager to establish a workable, motivate-able, and reliable group to help oversee the project implementation. This is of utmost importance because the project budget, schedule, quality and risks may be affected by this selection process.

HR Administration: An HR administrator works closely with managers and employees on the project to resolve employee issues, review performance appraisals, administer compensation program, enforce corporate policies and procedures, oversee organizational growth and facilitate internal investigations as needed. He has to be put in place first, recruited, to ensure that all these activities as well as recruitments are initiated. He has to be on-board at the project preparation phase- which is the first step towards the larger project execution phase. At this phase the HR administrator garners all the required resources of setting up the project. Whereas the project planning stage involves paper-work and planning towards success with strategies that are realistic and cogent, project planning gives a start to execution. The project planning phase lends clarity on the project scope, the available

resources, and a schedule of activities that map out how to achieve the stated objectives using the available resources.

Project Orientation

When new resources join the project, the Project Manager provides an orientation to the project. The orientation involves discussing the following topics:

- background of the project;
- current status of the project;
- specific job duties and expectations;
- introduction to the existing staff; and
- Overview of the project processes, including time reporting, attendance, and status meetings.

Project Execution

"Project management has been based on a wide range of authority for the project manager. Project expediter, project coordinator, matrix project manager, and line project manager- call them what you want they represent increasing degrees of authority. Underlying these organizational approaches to project management, however, are the highly formalized techniques of applying specifications, work breakdown structure, work packages, critical path network planning and control, and reports of performance cost time."[2] Here a project manager must lead and motivate the team to optimal performance regardless of conflicts. Conflict resolution is an important skill to employ. Praise, encouragement and positive support are key elements of this process. Rewards and acknowledgement of achievement also improve team management process. Communications and negotiation are foundational in coordinating project and personal needs. Managers challenge team members, support them to success and recognize their achievements. All this is shouldered by the HR. Human Resources is the heart of project execution–and one of the most crucial part. All planning comes to naught if execution does not take place or is done improperly. The people element plays the most crucial role. Successful project execution depends on the cooperation, commitment, and enthusiasm of the workforce to perform as required, and the ability of the project managers to manage the workforce well, to extract the best out of the available resources.

Project-related Staff Development

The Project Manager or team leader reviews the related skill-sets of project staff against the new and continuing roles and responsibilities needed for each phase. HR is responsible for maintaining core competency skills. The project HR is responsible for project specific training and/or development, depending on business need.

Manage Project Team

Staff Management

Day-to-day management of the project staff is the responsibility of the Project Manager and the delegated team leaders. HR being the primary "right hand" man. Performance evaluations, performance issues and recognition, promotions, and disciplinary actions are the responsibility of the HO in collaboration with the site HR person. The Project Manager provides feedback to the HO on the performance of the resources HR person at site facilitates this.

Staff Transition to Other Projects/Organizations

In the event that a resource leaves the project prior to project completion, the team leader re-assigns the resource's responsibilities to an existing or new team member. The Human Resource Manager will coordinate the transfer of the departing resource to the new project/organization. It is key to staff morale that transitioning be managed well.HR may have to dig into his resources to fetch an operative if not easily available. His resourcefulness comes in handy here.

Replacement of Staff

Project employee staff vacancies are addressed through the home unit; the head office or HO. The Project Manager works with the HR Manager there at HO to advertise positions and conduct interviews. Project consultants need to be replaced in accordance with the procedures found in their contractual agreement. The HR Manager at the HO acquires new consultant staff as and when required. Wherever possible, the replacement resource (whether an employee or a consultant) will begin work prior to the original resource's

departure. This is to ensure the appropriate transition of responsibilities and knowledge. But that is not always possible and HR again comes in to help find a mentor.

Team Building

Developing a cohesive team is key to the success of any project. A project team must be clear on common project goals. A common understanding and acceptance of goals within the team helps build a sense of ownership leading up to the Implementation Phase. So, in addition to creating an effective HR Management Plan, or acquiring and managing project human resource, a project manager needs to consider the human factor. A group is not the same as a team. Groups are not cohesive and have not yet formed effective internal bonds. Teams go through a maturity cycle: "forming, storming, norming, performing and adjourning". Some conflict is normal before the optimal performance stage can be attained. Teams need to gel and develop a team identity or chemistry.

Getting together as a team outside the project environment and participating in social activities or group challenges has many benefits in terms of building team cohesion. Teams that like each other and have more common positive reference points and experiences are more productive in the long run. Team building occasions are useful for celebrating achievements. They build chemistry and the sense of "us".HR works closely with the project manager to make this a success.

Leadership and Motivation

On the project space, managing a project and leading a team aren't mutually exclusive. A manager administers, while a leader innovates; combine the two and we have innovative project administration. Project managers with leadership qualities in them, along with strong technical skills, are a great asset to any business. They increase the chances of a project's success by a good margin.

Leadership is the process of social influence involving one person and the motivation or the desire or willingness to do something. Very often, the leadership style has a direct bearing on employee motivation. The leader seeks to enlist the support of the Hr to get to the workforce and work them toward the successful completion of the task on hand; he uses the human resources available on hand

optimally. Success, however, depends on how eager the workforce remains to oblige, and this in turn depends on exhibiting the most appropriate leadership skills.

Process Assessment of Human Resource Contributions

1. In our project we have employed remote and virtual teams and facilitated the emergence of the knowledge worker.
2. Adopting the behavioral approach of management to preset the latest and the most pressing people-related challenge to project execution.
3. Focus is another important ingredient for success. Good leaders know how to remain focused on the task at hand and ensure that their team does the same. We did this by keeping their goals SMART: Specific, Measurable, Achievable, Realistic and Time bound. Additionally, in order to ensure overall alignment of the project goals, we ensured a mechanism for constant feedback loop.
4. Of crucial significance is managing change. All projects are, in a sense, a change from one state to another, and success depends on managing and overcoming resistance to change. This was done by counseling, holding weekend sessions and workshops, constant HR interaction with the working staff-rather than sitting in the office and watching out of the window, HR people moved around 4 hours each day on the worksite encouraging and addressing Human issues.

In Conclusion: Even in the most dynamic environment, not everything can be emergent. Organizational agility doesn't just happen; it has to be deliberately pursued. A limited number of integrated human resource initiatives define a comprehensive project oriented human resource strategy. Key human resource initiatives guide the choice of human resource programs and practices. The Initiatives of Project Owners and cooperation of the project and Human Resource management and their collaborating visions make this emergent scenario possible.

R E F E R E N C E S

1.Review of Effective Human Resource Management Techniques in Agile Software Project Management Geshwaree Huzooree, Vimla Devi Ramdoo ,International Journal of Computer Applications (0975 – 8887) Volume 114 – No. 5, March 2015 10

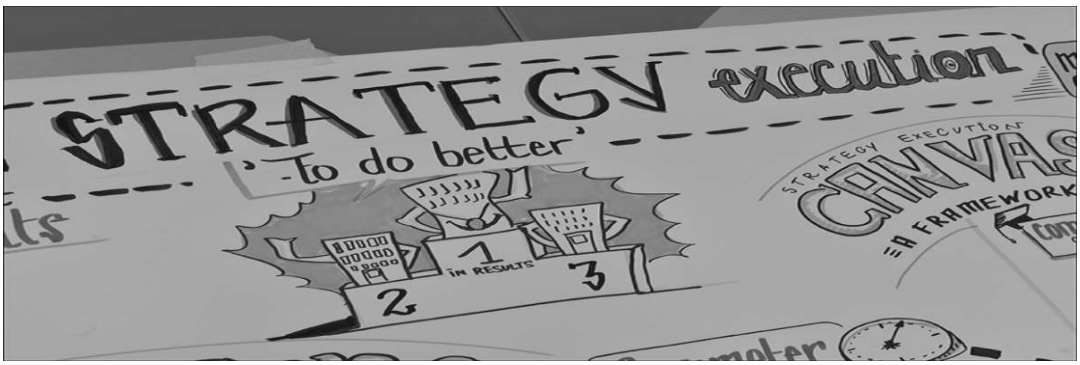
2. Managing human resources in project management. Murdick, R. G. (1976). Project Management Quarterly, 7 (2), 21–25.

3. A Guide to the People Aspect of Project Management, Project Management Methods & Ideologies, N Nayab https://www.brighthubpm.com/methods-strategies/124831-all-about-human-resource-management-in-project-management/

4. The Four Phases of Project Management, Harvard, 2016

C H A P T E R 7

ENDING THE PROJECT-The Role of Human Resources in tying loose ends.



"Have a good plan. Execute it violently. Do it today." — General Douglas McArthur

Introduction:

Human Resource Management (HRM) impacts project management. Human Resources in Project Management focuses on the recruitment of the Project Team, its organization and management until the end of a given project. But HR's role starts from defining core competencies which are going to be needed, to team building and motivation. HR and Project management have a strategic connection being useful for company competitiveness.

Some say that Human Resources are the key of every work done within a company as they represent people. Project Management is measured by the different project success that can represent benefit, innovation or any improvement by these people. It appears that project success require success in team project management, which is the HR function. Therefore when the project ends the question arises as to what role does the HR play in this procedure. The question of when a project formally ends is one that most people do not find easy to answer for every organization. We all know that a

project is a temporary endeavor having a start and an end date. The project ends when the money runs out. Although in many projects, this is actually true, it doesn't help you in terms of the basic definition. Ending a project when the budget runs out is highly subjective. It doesn't answer the more fundamental project management question of how to define the end of a project. One idea is that an end-of-project meeting could mean the project is officially over. Let us examine what constituted the ending of a project and what role if any is played by the Human Resource persons or departments both at site and at Head Office.

1. Sign-off

Perhaps the earliest date the project could end is when the client sponsor formally approves the project deliverables. Projects build the deliverables for some owners/ clients. It makes sense that the project be termed as completed when these owners or clients are satisfied. This may involve presenting the deliverable for approval, and then performing rework based on their feedback. However, for the project to end successfully, the deliverables must be approved. The project could also end if the final deliverables were rejected and no further work is planned.

Thus the end of a project is equally important- a lot of work is required not only to end the project but also to make a technical completion. There many tasks that must be completed. These are procedural such as approvals, signatures, payments and a celebration to commemorate the completion. At a sign off the HR person is generally present because over the life of the project both the internal and external customers have identified his importance and role. The close of the project is the last turn of the project life cycle -final phase of the job. There is a process to this closure normally divided into 5 phases:

2. End of Project Report:

If the project involves work for an external customer, this project report could be required by contract, especially if the amount or timing of a final payment will depend on the information in your report. ‘

Even when a final report is not specifically called for in a contract, internal and external stakeholders will likely be expecting one, so it's best to deliver your report as soon as possible after your project work is complete. Several purposes are served by this report including:

- Informing senior stakeholders, who may not have been actively engaged during any phase of the project, that the project is complete.
- Informing other departments or organizations that work is complete, and that no further resources will be needed for the project. This allows funding and employee availability to be released for use on other projects.
- Documenting any variances from the planned budget or schedule, along with explanations as to why the variances occurred. This can help you draft a more accurate project plan when you manage similar projects in the future, and can also help other project manager's plan their own projects. Regardless of whether the end of project report is short or long its purpose is:
- Document the end deliverables- what the project team delivered
- Evaluate the Project in terms of work quality and time and scheduling.
- Evaluate budget and schedule performance objectively and honestly.
- This report is a formal presentation, an entry in a project management tool, and a document that can be circulated to different stakeholders, each of the below should be included in an end of project report:

  Project description of the process of approval and the end product.
- A summary of the project execution, including whether the project met its objectives.
- Project's budget performance details and schedule adherence success.
- Any factors that affected the project results either + vely or -vely
- The report can start off with a description of the financial impact or cost- benefits analysis the project will provide.
- Role of HR of the project or surroundings such as employment generation, training on vocational issues and allied HR topics can be presented
- Attachments or appendices containing summaries (or the full text) of important project documentation, such as the scope document, project plan, test results and final approval/acceptance.

3. Complete Project-work: Projects generate numerous tracking documents that will need the attention of the project managers and owners. They are going to have to be signed off and approval

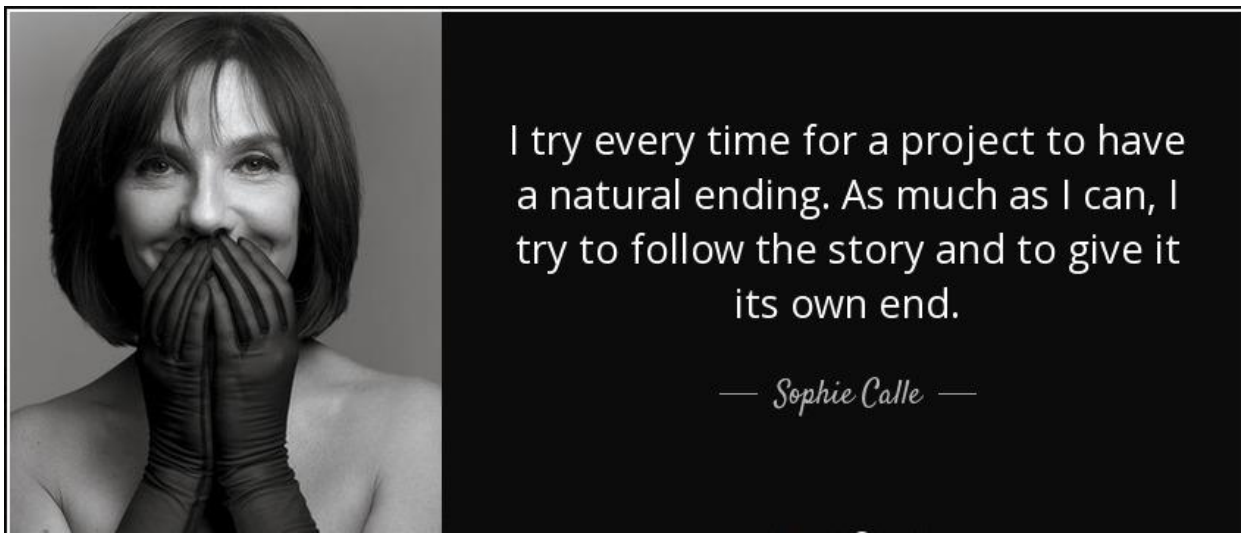
from the stakeholders including the owners, which is the legal proof that in fact these documents have concluded. That includes closing all contracts made with internal partners and vendors or other resources that one has contracted with.

4. Payments: Addressing all pending payments is equally important of else legal trouble can follow. One needs to complete all the costs involved with the project this includes all outstanding payments such as invoices, commissions, fees, part and pending payments, bonus etc. This is often called Releasing Resources. The PM here ensures that all invoices have been sent to the project clients and that all have been paid for. If there are any outstanding invoices with the client you need to follow up with them and find out why they haven't been paid and if there are any outstanding issues that would make them not want to be finalizing the invoice with payment. This is more likely an oversight on the customer's side but it could be dissatisfaction with any of the work performed or deliverable provided and hence this needs to be sorted out and any modifications, extra work done after agreements. This is one area of importance if any manpower allocations are missing. HR handles them.

5. Arrange a Post Mortem

Managing a project is a learning experience. Many projects see a Post Mortem before closing so that this learning can be consolidated. What has been the learning throughout the project, needs to be consolidated and that too before the closure so that the remnants and successes can be identified. Time to work back and take aid of HR too.

The core team is gathered and feedback is invited about what worked, and what didn't. By documenting the mistakes and the successes of the project, one is building a catalog that offers historic data. You can go back and look over the information for precedents when planning for new projects. Projects are never standalone things, but part of a continuum, where the specifics might vary, but the general methods usually remain the same. There's a wealth of knowledge produced after any project closes. Generation of HR strategies and documentation of these is crucial.


I try every time for a project to have a natural ending. As much as I can, I try to follow the story and to give it its own end.
— Sophie Calle —

Not to mention, when you are ending one project, you're likely beginning another. Therefore, you want to get transition support for this changeover. You'll have to release resources, archive documents

You assemble a team for the project, and now you must cut them loose. It's a formal process, and a crucial one, which frees them for the next project. Each team is brought together for the mix of skills and experience they bring to a project. The project determines the team members you'll want to work with, and each project is going to be a little bit different, which will be reflected in the team hired to execute it.

This is true for internal as well as external resources. The external ones might be more obvious, as you contracted with them, and that contract is going to have duration. When it's over, make sure they're all paid in full so they can sign off and leave. But internal resources remain, so you have to remind yourself that their time on the project is also limited, and you might be blocking other team's projects if you don't release your resources once the project is done.

6. Archive Documents

There are lessons to be learned from old projects, which is why you meet with your team regularly during the project and look back on the process afterwards. However, if you don't have an archive in

which to pull the old records, then whatever knowledge you gain is lost because of poor organization and management. You worked hard to have great project documentation, don't lose it. Before you close a project, archive all the documents and any notes and data that could prove useful. Even if you never access it, there's a need to keep a paper trail of the work done on any project for other people in the organization. This might include legal teams, or HR teams, or even your successor. It is quite unpredictable when someone might have to go back and respond to a question or want to learn how an old issue was resolved. And all these could be needed for a future project.

7. Celebrate Success

If an end of project report is used by project managers and their team at the end of a project to determine how the project performed then a farewell party becomes the order of the day. This is all about rewarding the team and acknowledging their successes. It creates closure and builds morale for project performers who move on to other projects or duties. Here is good will creation. When their efforts are recognized their morale is built up. Many companies have a party and present prized of mementos. It helps people forget if any harsh terms or words have been imposed on them by their supervisors.

The project was successful, team member morale is high and you want to capitalize while the momentum is in place and everyone is getting ready to head off to a next project assignment. One way to promote the success is to send out a company-wide email or mini press release that highlights the success of the project with some details and calls out each team member to give them the recognition they deserve. The PM or the owners draft something like an acknowledgment letter and send all the company employees. This creates loyalty, and keeps the most important source and resource intact for future assignments. Organize an end-of-project meeting: One idea of this meeting is that an end-of-project meeting could mean the project is officially over. Although ending the project at the end-of-project meeting helps a little bit, it doesn't answer the total question, since you still need to decide when to schedule this meeting.

8. UAT: In software development projects user acceptance testing (UAT)—also called application testing, and end user testing—is a phase in which the software is tested in the "real world" by the intended audience or system so that UAT completion and sign off is extremely important. UAT is

about the same as complete sign off of the final solution in a normal non-software project. This does not mean a sign off on everything to cover oneself in case the client comes back….. But you never know and it's better to. In normal projects a completion report is given to the client prior to which it is not incumbent but a best practice for the Project executing organization to get the clients representative on board and show the progress once and for all.

Project Management is measured by the different project success factors. It is quiet apparent that the success of a project require success in team project management, which is the HR function. And consequently, all loose ends are tied together by HR and therefore an eulogy to HR is a must at the project end stage.

CHAPTER 8

Innovative Human Resources- Today's Scenario

Innovation distinguishes between a leader and a follower.
-Steve Jobs

Innovate
make changes in something established, especially by introducing new methods, ideas, or products.
"the company's failure to diversify and innovate competitively"
introduce (something new, especially a product).
"we continue to innovate new products"

A B S T R A C T

Over the last two decades there has been an unprecedented increase in the number of organizations that have adopted innovative Human Resources in their operations. HR innovation is the implementation of new ideas, methods, and technologies to better meet the ever-evolving requirements of the organization and its workforce. It's about anticipating future needs and circumstances rather than simply finding a response to a changing present situation. Such expansion of HR has meant that issues associated with the management of human resources across pioneering borders are increasingly important to human resource managers and academics. The research presented in this paper examines HR innovation of new ideas, methods, and how these technologies meet the pedagogy and practice in Organizations.

We, in the management world, are currently very much in a candidate-driven marketplace so there is a real need for HR to focus on mirroring the consumer world. Innovative journeys start with an inherent desire to manage risks. Human Resource as a key driver of the activities comes under the spell of these path-breakers. HR is striving to address the question of how it can contribute to organizational success. By viewing organizations as non-linear systems, focusing on interconnections between points in the system, and stressing the importance of network nodes in mediating organizational outcomes, complexity theory suggests, at a conceptual level, that the significance of HRM may lie more in processes than in policies or strategies. So we are focusing the telescope of this paper's agenda on processes- Innovative ones.

Another important task for Human Resources is to ensure that managers are leading their teams effectively as well as helping executive management establish the strategy for the future. The Organization has to learn more about purpose-driven leadership and employee engagement findings with respect to progressive management practices. Some of the companies practicing innovative Human resources are so original in their HR strategies and so transparent in their thinking that it's easy to make our heads spin — but proper dedication and execution can make all the difference in making sure that organizations get filled with the right people. In this paper, we use the lens of complexity theory to explore the processes by which HR departments contribute by shifting the focus of attention away from HR's contribution to performance at an aggregate level, towards a more finely-grained analysis focusing specifically on the processes adopted by HR in helping to achieve organizational objective.

We all know that companies worldwide are fighting hard to hire and retain top talent. In addition to keeping up with the latest trends in technology, businesses today must also plan and implement creative HR ideas or they risk being left behind. From hiring new employees efficiently, on-boarding them enthusiastically, training them strategically and engaging all employees thoughtfully, there are many opportunities to stand out with creative and innovative HR practices.
Specialized design, administration and analysis of employee surveys have began to play an important part in driving organizational recommendations based on a strategic plan. These surveys results in:

1. Reduce turnover
2. Identify organization-wide strengths

3. Improve productivity
4. Solicit ideas for corrective action
5. Gather objective data and make informed decisions
6. Establish benchmark data to evaluate future improvements
7. Solicit employees' involvement in the process of change

Some of the most unique and innovative HR practices are:

1. Hire quickly and fire slowly

When it comes to hiring and firing, there is a sort of unwritten rule that most companies must hire quickly and fire slowly.The most harm actually comes from hiring mistakes. Amazon also started their own Pay to Quit program. Amazon's employees get this offer once a year, the first an offer for $2000 with annual increases of $1000 each year after that, with a maximum of $5000.They are told to quit,if they don't,it means they want to be loyal employees.

2. Develop Mentorship Programs to Engage Employees

About 600 million people, more than half India's population, are under 25 years old; no country has more young people. By 2020 this will become 50% of the global workforce, putting a tremendous demand on hiring quality. Mentorship helps them stay longer due to the involvement of their team member's training and development. Training snippets of how the work is best performed are shown to the mentorees to make them understand what is expected of them.

3. Innovative data collection and applications

Exit Interview Questionnaire

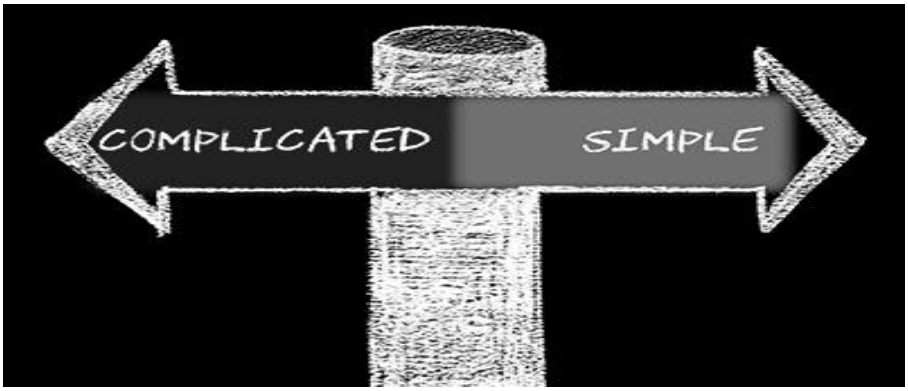
The **Exit Interview Questionnaire** provides you with critical information about the climate within your organization and the attitude of departing employees towards the organization. The exit interview also allows for your departing employees to offer suggestions for making your company a better place to work. Exit Interview Questionnaire is designed to help management examine a wide range of organizational issues quickly and efficiently. Typical reasons why companies conduct exit interviews include:

- To learn and analyze why employees are leaving
- To take corrective action to reduce turnover
- To improve company performance and employee productivity
- To improve employee satisfaction

New Hire Survey

The **New Hire Survey** monitors new employee satisfaction at an early stage to better align employee engagement with the employer's needs. It is an employee survey for those new employees who have been with the organization between 30 and 90 days. This survey provides a process to help leaders in the organization better understand the new employees' attitudes towards the hiring process, job goals and expectations, supervision, training and career opportunities. The New Hire Survey will help employers refine their hiring process in order to get the best talent in the most efficient and effective manner.

In this survey, the new employees of the organization evaluate the on-boarding process based on a specific set of standard or custom statements. They will be able to share ideas and concerns about important on-boarding topics such as the thoroughness of the interview process and the new hire orientation.



Typical reasons a company might conduct a New Hire Survey include:

- To determine if the recruitment and sourcing process was effective
- To verify if the new hire's tools and equipment were set up properly and on time
- To highlight areas for improvement in the orientation process
- To evaluate the new hire's satisfaction with their manager
- To better align employee engagement with the employer's needs

Pulse Survey

The Pulse is designed to provide a snapshot of the organization's satisfaction level and attitude over time. The results of this type of feedback provide management with an understanding as to how the employee perceives the organization. The Pulse will help management examine a wide range of organizational issues quickly and efficiently. The **Pulse** demonstrates to employees that their views and ideas are considered important. This will help motivate employees and improve productivity. An anonymous employee survey process can also be used to discover what your employees are thinking. Typical reasons why companies conduct a Pulse include:

- Assessment of employee satisfaction over time
- Determination of the company's success in ensuring management accountability
- Establishment benchmarks for performance

Comprehensive Survey

The Comprehensive Survey provides a detailed analysis of your employees' satisfaction level, engagement and attitude towards the organization. The employees may not only have questions, but answers as well. Top-performing organizations understand that employee satisfaction and engagement with the business are the key drivers of business success. Satisfied and engaged employees are productive and customer focused. As a result, organizations where there are high levels of satisfaction and engagement are more likely to be financially successful.

Incorporating satisfaction, engagement and importance through our extensive normative-based statements allows us to create overall satisfaction, engagement and importance ratings to evaluate company performance at both the module and statement level. Utilizing this three tier approach allows companies to better measure employee and company performance. Increasing employee satisfaction and engagement for our clients directly correlates to a work environment where businesses are more successful and where Human Resource metrics directly relate to sustainable business outcomes.

Typical reasons why companies conduct a Comprehensive Employee Survey include:

- Identify employee relations issues confidentially and anonymously

- Independently evaluate your management teams' strengths and weaknesses
- Align your compensation and benefit programs with your employee needs
- Identify organization-wide issues and solicit ideas for corrective action
- Gather objective data from which management may develop a meaningful dialogue
- Establish benchmark data to evaluate employee engagement and improvements for the future
- Reduce turnover
- Solicit employees' involvement in the process of change
- Improve productivity, quality and customer service through the development of action plans

Check-Up Survey

The Check-Up Survey is a targeted employee survey. It demonstrates to employees that their views and ideas are considered important. This will help motivate employees and improve productivity. This survey provides a quick snapshot of your employee's satisfaction level and attitude towards the organization. This product is very cost effective and can be typically launched within 5 days of the engagement. Typical reasons why companies conduct a Check-Up Survey include:

- To assess employee attitudes following a merger or acquisition
- To determine the company's success in reducing turnover
- To evaluate employee satisfaction following the completion of a total compensation project
- To better align the benefit plans with employee needs

Define employee roles by outcomes, not tasks.

Task-based job descriptions focus on processes, not results, so the latest is the need to add a innovative twist of redefining roles in the organization for outcome-focused measures of success. For example, “write three to five press releases per month” could become “generate 20+ press mentions per month.” This approach shifts the focus from “how” to “what.” It flexes employees’ creative problem-solving muscles and empowers them to concentrate on what actually matters: results.

The starting place should be, what is it that will have profound, tangible effects on employee morale and productivity? When you simplify the policies that slow down or annoy employees you score support for a culture of simplification which can help everyone eradicate low-value tasks and get to work that matters. HR is seen to have no purpose except to validate an organizational process in some way or the other and acts a 'gatekeeper for information' that's been deemed too highly classified for the data owner. HR's contribution is not measurable - in fact, the opposite. HR involvement creates a queue or delay in the process. Using HRIS an employee can safely amend his or her own address or bank account details, while the ability to change certain appraisal details might be confined to the line manager. In either case, there is no reason for HR to be involved. HR should move on from the role of intermediary to being proactive in HR innovations that contribute directly to the bottom-line or improve employee morale and efficiency.

Many well-known examples of the use of information technology for competitive advantage involve systems that link an organization to suppliers, distribution channels, or customers. In general, these systems use information or processing capabilities in one organization to improve the performance of another or to improve relationships among organizations. Declining costs of capturing and using information have joined with increasing competitive pressures to spur numerous innovations in use of information to create value. HRIS: as the role of human resources department expanded in complexity, HR technology systems expanded and evolved to fit these. HRIS shape an intersection in between human resource management and information technology. It merges, in particular its basic HR activities and processes, with the information technology field, whereas the planning and programming of data processing systems evolves into standardized routines and packages of enterprise resource planning (ERP) software. On the whole, these ERP systems have their origin on software that integrates information from different applications into one universal database. The linkage of its financial and human resource modules through one database is the most important distinction between innovation in HR and its predecessors that focused on individuality and proprietary issues.

Innovation has also meant that HR professionals are taking a much more holistic view of employees, creating health and wellbeing strategies and moved away from rewarding long hours. All these strategies result in productivity focused employees.

CHAPTER 9

ADJECTVES IN ARCHITECTURAL VISUAL CONCEPTS

"Good interior design adds a new dimension to a space. It can increase our efficiency in the way we go about our daily lives, and it adds depth, understanding, and meaning to the built environment. Thoughtful and well-crafted design makes a space easier to understand, and experiencing such a space lifts the spirit, too. It is, therefore, not just about the aesthetic but it is a practical and philosophical discipline."

The Fundamentals of Interior Design-Simon Dodsworth, and Stephen Anderson

Summary

As the complexity and quality of interiors and their hyphenation with the modern, trendier, data analytical or image analytical improves, there is increasing interest in annotating images with linguistic descriptions ranging from single words describing the depicted objects and their properties to richer expressions such as full-fledged image captions. This trend has generated wide interest in linguistic annotations beyond concrete nouns, with the role of adjectives in image descriptions receiving, in particular, much attention. This paper analyses the role of adjectives in the architectural Interiors phenomena.

Introduction: *Adjective* comes from Latin *nōmen adjectīvum*, or the Greek 'additional noun'. In the grammatical tradition of Latin and Greek, because adjectives were inflected for gender, number, and case like nouns (a process called declension), they were considered a type of noun. The words that are today typically called nouns were then called *substantive nouns*. The terms *noun substantive* and *noun adjective* were formerly used in English but are now obsolete. An adjective modifies a noun; that is, it

provides more detail about a noun. This can be anything from colour to size to temperature to personality. Adjectives usually occur just before the nouns they modify. In the following examples, adjectives are in bold, while the nouns they modify are in italics (the big *bear*):

- The generator is used to convert mechanical *energy* into electrical *energy*.
- The steel *pipes* contain a protective sacrificial *anode* and are surrounded by packing *material*.

Adjectives can also follow a linking verb. In these instances, adjectives can modify pronouns as well. In the following examples, adjectives are still bold, while the linking verb is in italics this time (the sun *is* yellow);

- The schoolhouse *was* red.
- I *looked* good today.
- She *was* funny.

Numbers can also be adjectives in some cases. When you say "Seven is my lucky number," *seven* is a noun, but when you say "There are seven cats in this painting," *seven* is an adjective because it is modifying the noun *cats*.

Adjectives are of special interest today in the design space because of their central role in so-called attribute-centric image representations. This framework views objects as bundles of properties, or attributes, commonly expressed by adjectives (e.g., homely, cool, even contemporary), and uses the latter as features to learn higher-level, semantically richer representations of objects. Attribute-based methods achieve better generalization of object classifiers with less data, while at the same time producing semantic representations of visual concepts that more accurately model human sentiments. The client says for a room-" I want a homely feeling". It is possible to create a visual concept by process rather than by inspiration. The technique is to select two or three adjectives from the brief that summarize the experience the client wants from the space. This may be easier than you imagine. The clients will often use words such as sanctuary, warmth, Urban, natural, and the like when referring to the feelings they want your design to generate, particularly when dealing with a residential project.

Creating Design from Adjectives: If the client doesn't have clearly established brand guidelines or is looking to change their visual language this could be a difficult or thorny task. Something can be aesthetically pleasing while communicating the wrong message. How then do we corelate between the emotions and the design attributes? One could ask the client directly, "What should this communicate and how should it look and feel?" Unfortunately, this rarely produces the right insights. Not everyone has the experience and training to answer that question, and more often than not responses refer to personal preferences rather than the best fit- personal preferences can hinder design nuances and reversing actual outcomes. However, it is true that having a conversation is a good starting point, and the most efficient questions will solicit the role of design adjectives.

Was it not Saint Laurent of YSL fame who said that *"It is my soul; I was not so happy at first. I never wanted to do a retrospective, and it ended up like that."* In doing so one can search for images that are strongly suggestive of these adjectives, and create a single unified collage. Generally, you will collect many images and edit them down to those that best illustrate the theory adjectives you have chosen the best imagery to use will be abstract rather than literal, as abstract imagery creates strong but flexible visual concepts. But literal images stop the imagination from working and may produce weaker concepts.

Comparisons are even more valuable. "Should this feel progressive or conservative?" Now stakeholders will not only have to think about what feeling the design should invoke, but also what feeling it *shouldn't* invoke. Again, understanding the "why" to this question is equally if not more important than the answer itself. Some adjectives are in fact comparable. For example, a person may be polite, but another person may be more polite, and a third person may be the politest of the three. The word *more* here modifies the adjective *polite* to indicate a comparison is being made (a comparative), and *most* modifies the adjective to indicate an absolute comparison (a superlative).

There is another way to compare adjectives in English. Many adjectives can take the suffixes *–er* and *–est* (sometimes requiring additional letters before the suffix; see forms for *far* below) to indicate the comparative and superlative forms, respectively:

great, greater, greatest
deep, deeper, deepest
far, farther, farthest

Some adjectives are *irregular* in this sense:

good, better, best
bad, worse, worst
little, less, least

Another way to convey comparison is by incorporating the words *more* and *most*. There is no simple rule to decide which means is correct for any given adjective, however. The general tendency is for shorter adjectives to take the suffixes, while longer adjectives do not—but sometimes *sound* of the word is the deciding factor.

more *beautiful* not *beautifuller*
more pretentious not *pretentiouser*

While there is no perfect rule to determine which adjectives will or won't take *–er* and *–est* suffixes, this video lays out some "sound rules" that can serve as helpful guidelines:

Characteristics are more effective descriptors. For example, *fun* is a characteristic, a personality trait. We can both imagine someone who's fun, and while you and I will picture different people the interpretation invokes the same feeling. *Clean;* however, is a descriptor, and you and I will likely have very different interpretations of what a clean design looks like.

With that narrowed down, we've found the following design adjectives most useful in a wide range of use cases (note: we didn't invent this list, we've just found it to be effective):

- Conservative
- Progressive
- Warm
- Cold
- Fun
- Serious
- Casual
- Formal
- Energetic
- Laid Back
- Trendy
- Classic
- Spontaneous
- Orderly

- Solitary
- Popular
- Unique
- Familiar
- Young
- Old

Exploring Look and Feel with Design Adjectives

A productive client discussion about how the organization wants the design (to be perceived) and how the target audience would feel about the perception might begin with questions like, "Ought this feel advanced? Why or why not?"

Many designers ask stakeholders to compare near opposites, and while it is effective there is indeed a sticking point–it is very easy to interpret the adjectives as extremes. Now you're probably wondering what design adjectives should I use? On a scale of 1 to 5 could be further useful.

These conversations can be our suggested starting points and finding the absolute best fit doesn't stop with having similar conversations with members of the target audience and running design tests with early concepts to validate your approach is having the impact you desire.

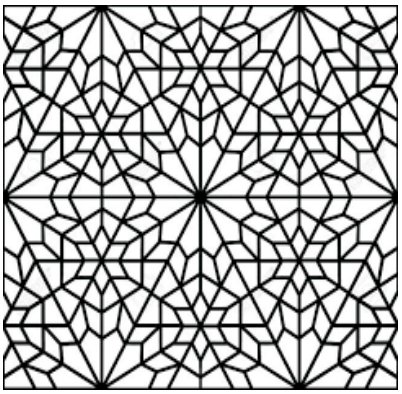
Finally, these few images will be further edited to produce a collage in which each image tells its own story and moulds with the others to create a single composition, thus reflecting the story that the client wants the space to tell. Once you have created the concept, the images can be read to give direction for the decorative scheme. The structure, colour, form, and style from the concept can all be echoed in the finishes one selects imagining the completed scheme with the same sensory experience as the concept. As the complexity and quality of interiors and their hyphenation with the modern, trendier, data analytical or image analytical improves, there is increasing interest in

annotating images with linguistic descriptions ranging from single words describing the depicted objects and their properties to richer expressions such as full-fledged image

captions. This trend has generated wide interest in linguistic annotations beyond concrete nouns, with the role of adjectives in image descriptions receiving, in particular, much attention.

CHAPTER 10

Arabesque in Architecture



arabesque/ˌarəˈbɛsk/noun
1.an ornamental design consisting of intertwined flowing lines, originally found in ancient Islamic art.
"arabesque scrolls"

A B S T R A C T

The arabesques and geometric patterns of Islamic art are often said to arise from the Islamic view of the world. To Muslims, these forms, taken together, constitute an infinite pattern that extends beyond the visible material world. To many in the Islamic world, they concretely symbolize the infinite, and therefore uncentralized, nature of the creation of the one God (Allah). Furthermore, the Islamic Arabesque artist conveys spirituality without the iconography of Christian art. Arabesque art consists of a series of repeating geometric forms which are occasionally accompanied by calligraphy.This Paper explores some of the concepts linked to the system of Geometric Design in the architectural world.

An arabesque is a pattern of curving lines layered with intertwined elements, like vines and leaves, and abstract forms that don't resemble anything found in nature. Decorative arabesque patterns can be found covering surfaces on buildings like mosques, as well as items like ceramic tiles and glassware.

Religion played an important role in the arabesque's development. When Islam rose around 700 AD and spread through the Middle East, it came with rules forbidding depictions of creatures like humans and animals, especially on things like buildings with a religious purpose, disrupting traditional portrait and landscape murals and paintings. As a result, Islamic artists instead based their imagery on geometry, calligraphy (the art of beautiful writing), and the arabesque. These elements didn't have recognizable creatures, so they could be used to adorn sacred spaces without relying on figural art. It's a very different idea about decoration than was found in Western culture at the time. The arabesque traces its history to the near and Middle East. Around 1000 AD, possibly near Baghdad, Muslim artists developed images of vines, flowers and lines into an intricate, spectacular art form. Such designs are considered biomorphic, which means they resemble natural forms without depicting specific creatures or plants.

Arabesque designs use elements like spiral and curving forms in an infinitely repeated, usually symmetrical pattern. Designs may feature many layers of interwoven figures and line. Sometimes, geometric figures are also included, as are forms called kapali, linear figures with closed ends. Arabesque designs on surfaces create a sense of pleasing overall rhythm and patterns. As the Islamic religion spread, arabesques could be found on walls of mosques and palaces, on ceramic tiles and vessels, and on glassware.

Arabesques have now been identified with fundamental element of Islamic art but they develop what was already a long tradition by the coming of Islam. The past and current usage of the term in respect of European art can only be described as confused and inconsistent. Some Western arabesques derive from Islamic art, but others are closely based on ancient Roman decorations. In the West they are essentially found in the decorative arts, but because of the generally non-figurative nature of Islamic art, arabesque decoration is there often a very prominent element in the most significant works, and plays a large part in the decoration of architecture.

The **arabesque** is a form of artistic decoration consisting of "surface decorations based on rhythmic linear patterns of scrolling and interlacing foliage, tendrils" or plain lines, often combined with other elements. Another definition is "Foliate ornament, used in the Islamic world, typically using leaves, derived from stylised half-palmettos, which were combined with spiralling stems". It usually consists

of a single design which can be 'tiled' or seamlessly repeated as many times as desired. Within the very wide range of Eurasian decorative art that includes motifs matching this basic definition, the term "arabesque" is used consistently as a technical term by art historians to describe only elements of the decoration found in two phases: Islamic art from about the 9th century onwards, and European decorative art from the Renaissance onwards. Interlace and scroll decoration are terms used for most other types of similar patterns.

Eventually the Islamic arabesque found its way to Europe, mostly through two avenues. It came through Southern Italy and Sicily, because they were close to geographic regions in which the Islamic faith had taken hold. These areas were also influenced by similar designs found on ancient Roman artifacts. Variations on the arabesque also developed on the Iberian penninsula in places like Spain, the westernmost edge of Islam's spread.

The architecture of Mughal monuments in India offers many examples of arabesque art. The Taj Mahal, tomb of Emperor Akbar, tomb of I'timād-ud-Daulah, the Fatehpur Sikri, the Agra Fort, the Red Fort and several others. The arabesque has also been defines *as a vegetal design consisting of full and half palmettes as an unending continuous pattern in which each leaf grows out of another*. It is symbolic of the unity of faith of Islam.The beautiful and striking designs created on many Mughal monuments are actually a combination of the arabesque-vegetal, geometric patterns and Islamic calligraphy. Islamic art is diverse and made up of stunning patterns, due to the absence of figures which could make it an object of worship, which is prevented in Islam. However, the core of the art is symmetry and harmony. There is an effort to convey the structure of everything through pattern. Geometry is an important element, it is sacred geometry with an inner and outer meaning.

Arabesque art depictions, mostly combined with geometry and calligraphy have two types, the first is about the principles that govern the order of the world. Geometric forms have a built in symbolism. The principles include the basics of what makes objects structurally sound yet pleasing to the eye. The square has equal sides and represents the important elements of nature, earth, air, fir and water. The physical world is symbolised by a circle that inscribes the square and would collapse upon itself without any of the four elements. The second type is based on the flowing nature of vegetal forms, representing the feminine life-giving force. The third type is the mode of Islamic calligraphy. it is also

called the *art of the spoken word*. Many proverbs and passages from the Holy Quran can be seen in arabesque art. The coming together of these three forms create the arabesque in its entirety. The art is not just mathematically precise but beautiful and symbolic. Many Islamic designs are based on squares and circles, interlaced to form complex patterns. A common motif is the 8-pointed star made of 2 squares, one rotated 45 degrees with respect to the other. Another basic shape is the polygon, mostly pentagon and octagon. Islamic artwork is found in *jaali* work or trellis tiling, woodwork, *kilim*s or rugs, leather book bindings, metalwork, ceramics and ceilings.
A glimpse into this fascinating world of visual art includes images from two important tombs in Agra, North of India, both from 17th century Mughal era.

"Islamic art can be best described as a sacred art. It is an art that is made purely for the sake of spiritual and religious devotion and expression, rather than art that is used to express the artist's own personal message or story. Traditionally the artist detaches himself from any praise or recognition of his work. Islamic art also embodies and expresses the teachings of Islam, whether it's through more obvious forms such as calligraphy and miniature painting, or more abstract approaches through the use of geometry and arabesque. Islamic art has also been compared to a form of *dhikr* or a remembrance of God, which in turn is a form of worship in a much more creative manner." [1]

For me personally Islamic art is a way for me to discover more about my own religion from a different perspective and approach. It is also a way for me to discover myself and through every piece I create I learn something new and invaluable."

SIGNIFICANCE OF ARABESQUE IN ISLAM: The arabesques and geometric patterns of Islamic art are often said to arise from the Islamic view of the world. To Muslims, these forms, taken together, constitute an infinite pattern that extends beyond the visible material world. To many in the Islamic world, they concretely symbolize the infinite, and therefore un-centralized, nature of the creation of the one God (Allah). Furthermore, the Islamic Arabesque artist conveys spirituality without the iconography of Christian art. Arabesque art consists of a series of repeating geometric forms which are occasionally accompanied by calligraphy.

To the adherents of Islam, the Arabesque is symbolic of their united faith and the way in which traditional Islamic cultures view the world. There are two modes to arabesque art. There are two

modes to arabesque art. The first recalls the principles that govern the order of the world. These principles include the bare basics of what makes objects structurally sound and, by extension, beautiful. In the first mode, each repeating geometric form has a built-in symbolism ascribed to it. For example, the square, with its four equilateral sides, is symbolic of the equally important elements of nature: earth, air, fire and water. Without any one of the four, the physical world, represented by a circle that inscribes the square, would collapse upon it and cease to exist. The second mode is based upon the flowing nature of plant forms. This mode recalls the feminine nature of life giving. The basic geometrical shapes used for inlay of geometrical arabesque are majorly constructed through repetition of lines and arcs. The regular repetition of such elements creates a kind of pattern which is then inlayed with different colors or materials and improves the aesthetic value of the surface. Muslim artisans also perfected the technique of creating decorative motifs of flowers, vines, and other graphics in precise geometric patterns. These “arabesque” motifs often cover walls, pottery, and other decorative objects and are governed by geometric and mathematical principles. The vines curve around and split off at very precise angles. [2]

The term ARABESQUE was first used in the West in Italian, where *rabeschi* was used in the 16th century as a term for "pilaster ornaments featuring acanthus decoration, specifically "running scrolls" that ran vertically up a panel or pilaster, rather than horizontally along a frieze. From there it spread to England, where Henry VIII owned, in an inventory of 1549, an agate cup with a "fote and Coeur of siluer and guilt embossed with Rebeske work", and William Herne or Heron, Serjeant Painter from 1572 to 1580, was paid for painting Elizabeth I's barge with "Rebeske work. Unfortunately, the styles so described can only be guessed at, although the design by Hans Holbein for a covered cup for Jane Seymour in 1536 (see gallery) already has zones in both Islamic-derived arabesque/Moresque style (see below) and classically-derived acanthus volutes. The use of "arabesque" as an English noun first appears, in relation to painting, in William Beckford's novel *Vathek* in 1786. Arabesque is also used as a term for complex freehand pen flourishes in drawing or other graphic media. The Grove Dictionary of Art will have none of this confusion, and says flatly: "Over the centuries the word has been applied to a wide variety of winding and twining vegetal decoration in art and meandering themes in music, but it properly applies only to Islamic art", so contradicting the definition of 1888 still found in the Oxford English Dictionary: "A species of mural or surface decoration in colour or low relief, composed in flowing lines of branches, leaves, and scroll-work fancifully intertwined used in

Moorish and Arabic decorative art (from which, almost exclusively, it was known in the Middle Ages), representations of living creatures were excluded; but in the arabesques of Raphael, founded on the ancient Græco-Roman work of this kind, and in those of Renaissance decoration, human and animal figures, both natural and grotesque, as well as vases, armour, and objects of art, are freely introduced; to this the term is now usually applied, the other being distinguished as Moorish Arabesque, or Moresque."[3]

Claims are often made regarding the theological significance of the arabesque, and its origin in a specifically Islamic view of the world; however, these are without support from written historical sources as, like most medieval cultures, the Islamic world has not left us documentation of their intentions in using the decorative motifs they did. At the popular level such theories often appear uninformed as to the wider context of the arabesque. In similar fashion, proposed connections between the arabesque and Arabic knowledge of geometry remains a subject of debate; not all art historians are persuaded that such knowledge had reached, or was needed by, those creating arabesque designs, although in certain cases there is evidence that such a connection did exist. The case for a connection with Islamic mathematics is much stronger for the development of the geometric patterns with which arabesques are often combined in art. Geometric decoration often uses patterns that are made up of straight lines and regular angles but are clearly derived as a whole from curvilinear arabesque patterns; the extent to which these too are described as arabesque varies between different writers.

Many arabesque patterns disappear at (or "under" as it often appears to a viewer) a framing edge without ending, and thus can be regarded as infinitely extendable outside the space they actually occupy; this was certainly a distinctive feature of the Islamic form, though not without precedent. Most but not all foliage decoration in the preceding cultures terminated at the edge of the occupied space, although infinitely repeatable patterns in foliage are very common in the modern world in wallpaper and textiles.[4]

Jali: This form of architectural decoration is found generally in Islamic Architecture but also found in Hindu Temples .Early jali work was built by carving into stone, generally in geometric patterns, while later the Mughals used very finely carved plant-based designs, as at the Taj Mahal. They also often

added pietra dura inlay to the surrounds, using marble and semi-precious stones. A jali or jaali, (Bengali: জালি, Urdu: جالی Hindi:जाली jālī, meaning "net") is the term for a perforated stone or latticed screen, usually with an ornamental pattern constructed through the use of calligraphy and geometry.

The jali helps in lowering the temperature by compressing the air through the holes. Also when the air passes through these openings, its velocity increases giving profound diffusion.[clarification needed] It has been observed that humid areas like Kerala and Konkan have larger holes with overall lower opacity than compared with the dry climate regions of Gujarat and Rajasthan.

With compactness of the residential areas in the modern India, jalis became less frequent for privacy and security matters.

R E F E R E N C E S

1. THE CRUCIAL ROLE OF GEOMETRY IN ISLAMIC ART, BY MALIKKA BOUAISSA .ARTJULY 27, 2013, http://www.alartemag.be/en/en-art/the-crucial-role-of-geometry-in-islamic-art/

2. Freely adopted from : Existence of Arabesque in Islamic Architecturel, Ar. Pooja Singh, International Journal of Scientific and Research Publications, Volume 7, Issue 6, June 2017

3. Arabesque (Islamic Art) - Western Arabesque, http://www.liquisearch.com/arabesque_islamic_art/western_arabesque

4. Arabesque (Islamic Art) - Islamic Arabesque http://www.liquisearch.com/arabesque_islamic_art/islamic_arabesque

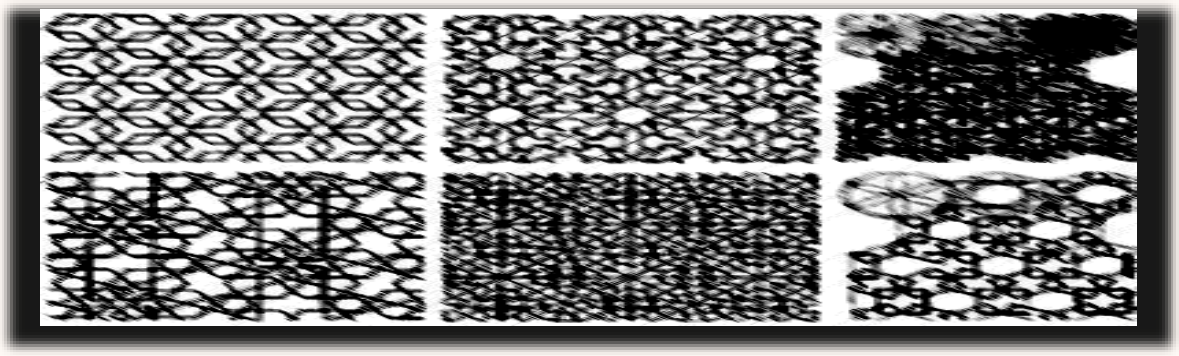
CHAPTER 11

(“ ISLAMIC”) MATHEMATICS AS ART

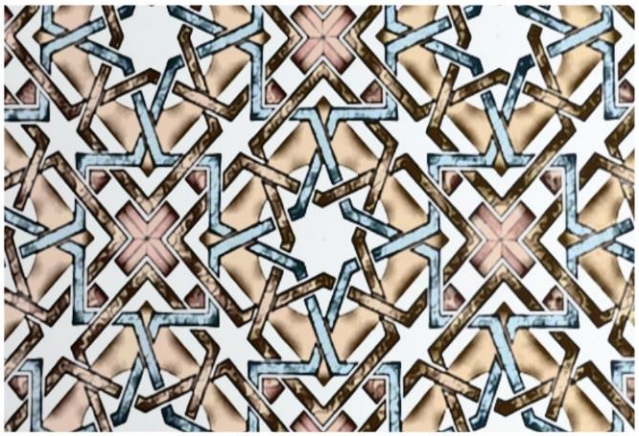
A B S T R A C T

The arabesques and geometric patterns of Islamic art are often said to arise from the Islamic view of the world. These patterns are derived from Geometry, either singly or combined, adorn all types of surfaces, forming intricate and complex arrangements. While geometric ornamentation may have reached a pinnacle in the Islamic world, sources for the basic shapes and intricate patterns already existed in late antiquity. This paper examines the role mathematics played in creating what is known as ISLAMIC ART.

Foreword: Mathematics and art are related in a variety of ways. Mathematics has itself been described as an art motivated by beauty. Mathematics can be discerned in arts such as music, dance, painting, architecture, sculpture, and textiles**.** Mathematics has directly influenced art with conceptual tools such as linear perspective, the analysis of symmetry, and mathematical objects such as polyhedral and the Möbius strip**.** The Islamic Empire established across Persia, the Middle East, Central Asia, North Africa, Iberia and parts of India from the 8th Century onwards made significant contributions towards mathematics. They were able to draw and fuse together the mathematical developments of both Greece and India. One consequence of the Islamic prohibition on depicting the human form was the extensive use of complex geometric patterns to decorate their buildings, raising mathematics to the form of an art. In fact, over time, Muslim artists discovered all the different forms of symmetry that can be depicted on a 2-dimensional surface.



Islamic craftsmen turned geometry into an art form because pictures of people were not allowed in holy places. Apart from the algebra, the trigonometry, the optics, the astronomy and the many other scientific advances and inventions of the Islamic Golden Age. Stunning patterns grace mosques, madrasas and palaces around the world. The mathematical elegance of these designs is that no matter how elaborate they are, they are always based on grids constructed using only a ruler and a pair of compasses. Islamic design is based on Greek geometry, which teaches us that starting with very basic assumptions, we can build up a remarkable number of proofs about shapes. Islamic patterns provide a visual confirmation of the complexity that can be achieved with such simple tools.



Introduction to Geometric Design in Islamic Art: The principles and teachings of Islam as a way of life, a religious code, and a legal system were promulgated by Muhammad (ca. 570–632 A.D.), an Arab merchant from Mecca. These teachings were revealed to him over a period of many years beginning in 610 and were subsequently codified in the text known as the Qur'an. The word of God, as set out in the Qur'an and handed down in the sayings of Muhammad (known as hadith, or Traditions), forms the core of the religion. The primary premise of the Islamic faith is monotheism, a renunciation of all deities except one, Allah, who alone is the creator, sustainer, and destroyer of life. Islam is Arabic for" submission, "here to the single entity of Allah. The recognition of Muhammad as

Allah's last prophet, a prophet like Abraham, Moses, Jesus, and the others that preceded Muhammad, is also a key element of the belief. Neither the Qur'an nor the Traditions contain specific mandates against figural representation in art. However, both sources take a firm stance against idolatry and the worship of images. These precepts were interpreted strictly by early Islamic religious leaders and exegetes as an injunction against the depiction of human or animal figures, although extant examples of architectural decoration, objects in all media, and illustrated manuscripts belie that stricture. Four types of ornamentation can be found in Islamic art: calligraphy, figural forms (human and animal), vegetal motifs, and geometric patterns.

These patterns, either singly or combined, adorn all types of surfaces, forming intricate and complex arrangements. While geometric ornamentation may have reached a pinnacle in the Islamic world, sources for the basic shapes and intricate patterns already existed in late antiquity in the Byzantine and Sasanian empires. Islamic artists appropriated key elements from the classical tradition, then elaborated upon them to invent a new form of decoration that stressed the importance of unity, logic, and order. Essential to this unique style were the contributions made by Islamic mathematicians, astronomers, and other scientists, whose ideas and technical advances are indirectly reflected in the artistic tradition. The basic instruments for constructing geometric designs were a compass and ruler. The circle became the foundation for Islamic pattern, in part a consequence of refinements made to the compass by Arabic astronomers and cartographers. The circle is often an organizing element underlying vegetal designs; it plays an important role in calligraphy, which the Arabs defined as "the geometry of the line"; and it structures all the complex Islamic patterns using geometric shapes.

The geometric designs in Islamic art are often built on combinations of repeated squares and circles, which may be overlapped and interlaced, as can arabesques (with which they are often combined), to form intricate and complex patterns, including a wide variety of tessellations. These may constitute the entire decoration, may form a framework for floral or calligraphic embellishments, or may retreat into the background around other motifs. The complexity and variety of patterns used evolved from simple stars and lozenges in the ninth century, through a variety of 6- to 13-point patterns by the 13th century, and finally to include also 14- and 16-point stars in the sixteenth century. Patterns occur in a variety of form in Islamic art including carpets known as kilims, Persian girih and Moroccan zellige tilework, muqarnas decorative vaulting, jali pierced stone screens, ceramics,

leather, stained glass, woodwork, and metalwork. Interest in Islamic geometric patterns is increasing in the West, both among craftsmen and artists including M. C. Escher in the twentieth century, and among mathematicians and physicists including Peter J. Lu and Paul Steinhardt who controversially claimed in 2007 that tiling at the Darb-e Imam shrine in Isfahan could generate quasi-periodic patterns like Penrose tiling.

These patterns have three basic characteristics:

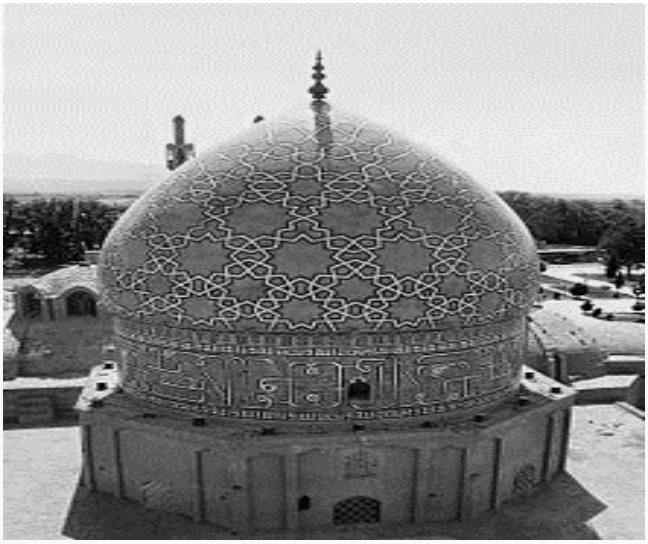
1. They are made up of a small number of **repeated geometric** elements. The simple forms of the circle, square, and straight line are the basis of the patterns. These elements are combined, duplicated, interlaced, and arranged in intricate combinations. Most patterns are typically based on one of two types of grid—one composed of equilateral triangles, the other of squares. A third type of grid, composed of hexagons, is a variation on the triangular schema. The mathematical term for these grids is "regular tessellation" (deriving from Latin tesserae, i.e., pieces of mosaic), in which one regular polygon is repeated to tile the plane.

2. They are **two-dimensiona**l. Islamic designs often have a background and foreground pattern. The placement of pattern upon pattern serves to flatten the space, and there is no attempt to create depth. Vegetal patterns are may be set against a contrasting background in which the plant -like forms interlace, weaving over and under in a way that emphasizes the foreground decoration. In other instances, the background is replaced by a contrast between light and shade. Sometimes it is impossible to distinguish between foreground and background. Some geometric designs are created by fitting all the polygonal shapes together like the pieces of a puzzle, leaving no gaps and, therefore, requiring no spatial interplay between foreground and background. The mathematical term for this type of construction is "tessellation." The conception of space in Islamic art is completely different from Western models, which usually adopt a linear perspective and divide the picture space into foreground, middle ground, and background. Artists of the Islamic world were largely uninterested in linear perspective. Of the various styles of Islamic art, it was in Persian painting that a type of three-dimensional space was used in which figures could interact, but this space presented multiple viewpoints and simultaneously featured bird's-eye and worm's-eye views.

3. They **are not designed to fit within a frame**. Geometric ornamentation in Islamic art suggests a remarkable degree of freedom. The complex arrangements and combinations of elements are infinitely expandable; the frame surrounding a pattern appears to be arbitrary and the basic

arrangement sometimes provides a unit from which the rest of the design can be both predicted and projected.

Pattern formation



The Shah Nematollah Vali Shrine, Mahan, Iran, 1431. The blue girih-tiled dome contains stars with, from the top, 5, 7, 9, 12, 11, 9 and 10 points in turn. 11-point stars are rare in Islamic art.

Further information: Mathematics and art and Girih

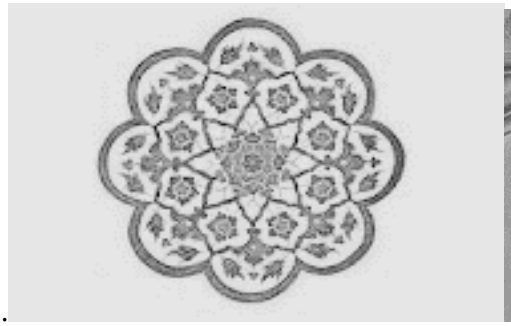
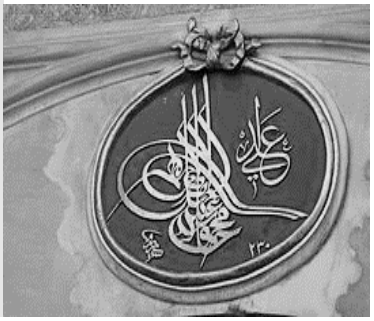
Many Islamic designs are built on squares and circles, typically repeated, overlapped and interlaced to form intricate and complex patterns. A recurring motif is the 8-pointed star, often seen in Islamic tilework; it is made of two squares, one rotated 45 degrees with respect to the other. The fourth basic shape is the polygon, including pentagons and octagons. All of these can be combined and reworked to form complicated patterns with a variety of symmetries including reflections and rotations. Such patterns can be seen as mathematical tessellations, which can extend indefinitely and thus suggest infinity. They are constructed on grids that require only ruler and compass to draw. Artist and educator Roman Verostko argues that such constructions are in effect algorithms, making Islamic geometric patterns forerunners of modern algorithmic art.

The circle symbolizes unity and diversity in nature, and many Islamic patterns are drawn starting with a circle. For example, the decoration of the 15th-century mosque in Yazd, Persia is based on a circle, divided into six by six circles drawn around it, all touching at its centre and each touching its two neighbours' centres to form a regular hexagon. On this basis is constructed a six-pointed star surrounded by six smaller irregular hexagons to form a tessellating star pattern. This forms the basic design which is outlined in white on the wall of the mosque. That design, however, is overlaid with an intersecting tracery in blue around tiles of other colours, forming an elaborate pattern that partially conceals the original and underlying design. A similar design forms the logo of the Mohammed Ali Research Center.

One of the early Western students of Islamic patterns, Ernest Hanbury Hankin, defined a "geometrical arabesque" as a pattern formed "with the help of construction lines consisting of polygons in contact." He observed that many different combinations of polygons can be used as long as the residual spaces between the polygons are reasonably symmetrical. For example, a grid of octagons in contact has squares (of the same side as the octagons) as the residual spaces. Every octagon is the basis for an 8-point star, as seen at Akbar's tomb, Sikandra (1605–1613). Hankin considered the "skill of the Arabian artists in discovering suitable combinations of polygons almost astounding." He further records that if a star occurs in a corner, exactly one quarter of it should be shown; if along an edge, exactly one half of it.

T O P K A P I P A L A C E

On the lacquered ceiling of the throne, studded with jewels, are foliage patterns accompanied by the depiction of the fight of a dragon, symbol of power, with *simurg*, a mythical bird. On the throne there is a cover made of several pieces of brocade on which emerald and ruby plaques and pearls are sown. Embossed inscriptions at the main visitors' door, dating from 1856, contain laudatory words for Sultan Abdülmecid I. The main door is surmounted by an embossed *besmele*, the common Muslim benediction, meaning "In the Name of God the Compassionate, the Merciful", dating from 1723. This inscription was added during the reign of Sultan Ahmed III. The tile panels on either side of the door were placed during later repair work

.

The Tiled Pavilion is the earliest building of Topkapi Palace, built by Mehmet II (the Conqueror). The striking tiles which adorn the entire building still display strong traces of Seljuk Turkish art in both the designs and the predominance of blue and turquoise. It is for this reason that the building has been transformed into a ceramics museum, where the finest examples of Turkish ceramics from the 12th century to the present day are on display. At the entrance to G'lhane Park is the Alay K÷sk' (meaning Ceremonial Pavilion) dating from the reign of Mahmud II (1808-1839) who watched various parades and processions from this vantage point.

The Topkapı Scroll, made in Timurid dynasty Iran in the late-15th century or beginning of the 16th century, contains 114 patterns including coloured designs for girih tiling and muqarnas quarter or semi domes.

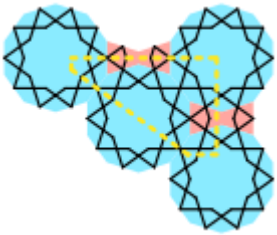
The mathematical properties of the decorative tile and stucco patterns of the Alhambra palace in Granada, Spain have been extensively studied. Some authors have claimed on dubious grounds to have found most or all of the 17 wallpaper groups there. Moroccan geometric woodwork from the 14th to 19th centuries makes use of only 5 wallpaper groups, mainly p4mm and c2mm, with

p6mm and p2mm occasionally and p4gm rarely; it is claimed that the "Hasba" (measure) method of construction, which starts with *n*-fold rosettes, can however generate all 17 groups.

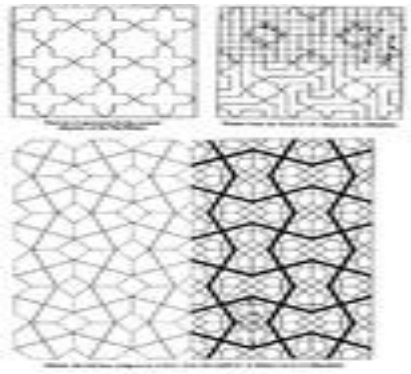
-

Two-dimensional designs for two quarter-dome muqarnas – as a seashell (top), as a fan (bottom). Topkapı Scroll, 15th century

Girih tiling in the decagonal pattern on a spandrel from the Darb-e Imam shrine



Construction of girih pattern in Darb-e Imam spandrel (yellow line). Construction decagons blue, bowties red. The strapwork cuts across the construction tessellation.



Analysis of octagonal patterns in Mughal architecture by Ernest Hanbury Hankin, 1925. 8-pointed stars emerge (lower right) where heavy black lines cross.

Decoration in Tomb of I'timād-ud-Daulah, Agra, showing correct treatment of sides and corners. A quarter of each 6-point star is shown in each corner; half stars along the sides.The four

Architectural drawing for brick vaulting, Iran, probably Tehran, 1800–70 [1]

Regional influence and the prevailing lifestyles during ruling dynasties determined the diversity of Islamic ornaments and geometrical patterns. For example, basic 6- and 8-point geometrical patterns, introduced during the late 9th century, are the most pervasive Islamic ornaments. Aside from their originality, the simplicity in construction of these patterns drove architects to use such ornaments in almost all building elements, from floor finishes to minaret surfaces. Whilst the difficulty of the abstract and the complexity of non-constructible geometrical patterns limited their application to

accessible elements (Qibla walls, window screens), particularly in Iran and central Asia. Another interesting result is that in contrast to the architects and artisans from other Islamic states, those from Anatolia paid less attention to ornaments and geometrical patterns; they focused more extensively on other aspects of architecture, such as form and master planning. For this reason, only a few examples of complex and sophisticated patterns (aside from the simplest ones) can be found in Anatolia.

The relatively stable government and economy during the Mamluk period encouraged architects to design very fine and detailed ornaments that are unique in terms of complexity. The intricate 16-point patterns remained popular in North Africa and Islamic Spain, but only minimally influenced eastern regions, such as Persia, Anatolia, and the Mughal region.

Simpler patterns were popular in the Indian subcontinent, which may be attributed to the passion of Indian artisans for symmetrical designs and their insistence on covering all exterior surfaces with ornaments. Such coverage would be difficult to achieve when complex patterns are used. For centuries, Islamic geometrical patterns (IGPs) have been used as decorative elements on walls, ceilings, doors, domes, and minarets. However, the absence of guidelines and codes on the application of these ornaments often leads to inappropriate use in terms of time scale accuracy and architectural matching.

Planar Symmetries

Planar symmetries have for millennia been exploited in artworks such as carpets, lattices, textiles and tiling. Many traditional rugs, whether pile carpets or flatweave kilims, are divided into a central field and a framing border; both can have symmetries, though in handwoven carpets these are often slightly broken by small details, variations of pattern and shifts in colour introduced by the weaver. In kilims from Anatolia, the motifs used are themselves usually symmetrical. The general layout, too, is usually present, with arrangements such as stripes, stripes alternating with rows of motifs, and packed arrays of roughly hexagonal motifs. The field is commonly laid out as a wallpaper with a wallpaper group such as pmm, while the border may be laid out as a frieze of frieze group pm11, pmm2 or pma2.

Turkish and Central Asian kilims often have three or more borders in different frieze groups. Weavers certainly had the intention of symmetry, without explicit knowledge of its mathematics. The mathematician and architectural theorist Nikos Salingaros suggests that the "powerful presence" (aesthetic effect) of a "great carpet" such as the best Konya two-medallion carpets of the 17th century is created by mathematical techniques related to the theories of the architect Christopher Alexander. These techniques include making opposites couple; opposing colour values; differentiating areas geometrically, whether by using complementary shapes or balancing the directionality of sharp angles; providing small-scale complexity (from the knot level upwards) and both small and large large scale symmetry; reeating elements at a hierarchy of different scales.

GIRIH TILES

Islamic art exploits symmetries in many of its artforms, notably in girih tiling. These are formed using a set of five tile shapes, namely a regular decagon, an elongated hexagon, a bow tie, a rhombus, and a regular pentagon. All the sides of these tiles have the same length; and all their angles are multiples of 36° ($\pi/5$ radians), offering fivefold and tenfold symmetries. The tiles are decorated with strapwork lines (girih), generally more visible than the tile boundaries. In 2007, the physicists Peter Lu and Paul Steinhardt argued that girih resembled quasi-crystalline Penrose tiling. Elaborate geometric zellige tilework is a distinctive element in Moroccan architecture. Muqarnas vaults are three-dimensional but were designed in two dimensions with drawings of geometrical cells

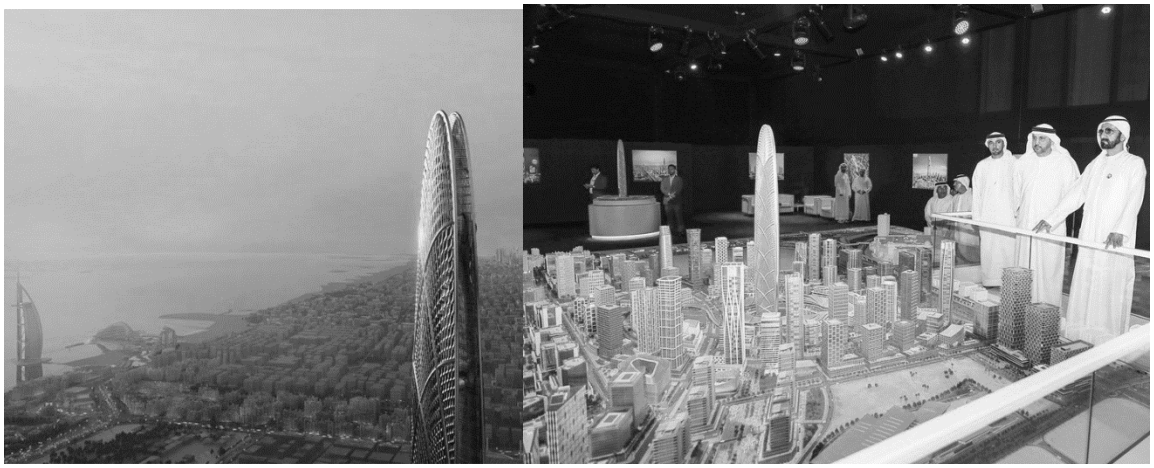
Symmetries are prominent in textile arts including quilting, knitting, cross-stitch, crochet, embroidery and weaving, where they may be purely decorative or may be marks of status. Rotational symmetry of Islamic designs is found in circular structures such as domes; these are sometimes elaborately decorated with symmetric patterns inside and out, as at the 1619 Sheikh Lotfollah Mosque in Isfahan. Items of leafy embroidery and lace work such as tablecloths and table mats, made using bobbins or by tatting, can have a wide variety of Penrose tiling. Elaborate geometric zellige tilework is a distinctive

element in Moroccan architecture. Muqarnas vaults are three-dimensional but were designed in two dimensions with drawings of geometrical cells.

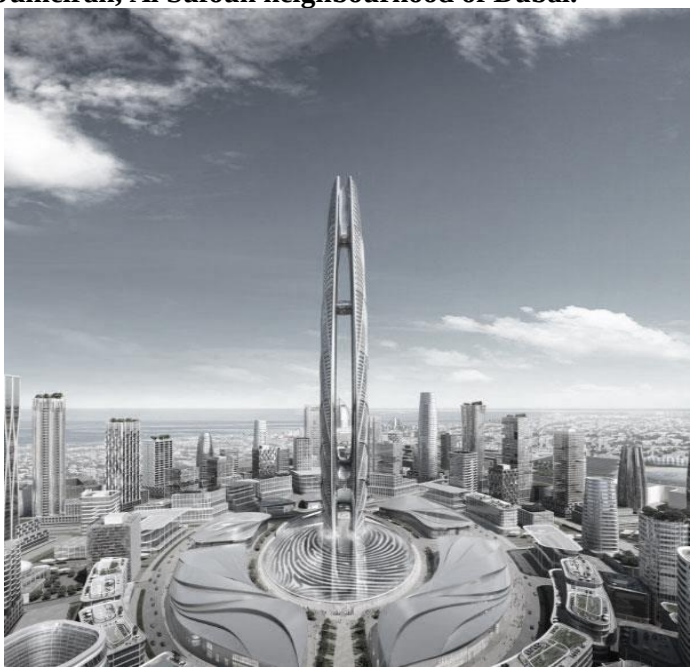
The visual intricacy of Islamic mathematical structures have inspired a variety of artwork - mathematical and otherwise.

C H A P T E R 12

PROSUMPTION ARCHITECTURE



Sheikh Mohammed Bin Rashid Al Maktoum the Ruler of Dubai and chief visionary, looks at a scale model of Burj Jumeirah, Al Sufouh neighbourhood of Dubai.



Introduction: Last year I visited Dubai on way to the USA. I was one of that a record-breaking, 22.8 million international travellers visited the emirate in 2018, representing a 16.2 per cent year-on-year increase in comparison to 2017. This barrage has further cemented Dubai's global position as one of the leading tourist destinations in the world. I watched in awe and travelled in AWWWEEEE- the many architectural, *one of a kind*, buildings that dot the landscape-surreal for the most. Dubai is known for its incredible vision and ingenious architectural feats, so it's no surprise that the city is home to some amazing building and structures.

Let me talk a little about Dubai before I come to what I am trying to focus my telescope on in this paper. The Architecture of the United Arab Emirates has undergone dramatic transformation in recent decades, from operating as a collection of fishing villages to a global business hub known for its innovation and dynamism. Between the 1960s and 1970s, architecture in the United Arab Emirates (UAE) remained solely traditional, with narrow alleys and wind tower houses still in use, reflective of a strong Bedouin and Islamic architectural heritage. Architecture is influenced by elements of Islamic, Arabian and Persian culture. In the early 1980s, Sheikh Rashid, the then ruler of the United Arab Emirates, employed British architect John Harris to create the stylish modernist architecture for which the major cities of the UAE are known today. The introduction of exposed glass curtain walls represented the beginning of a movement, used extensively in the design of almost every commercial and high rise building façade in the Persian Gulf. In less commercial areas, Emirati architecture continues to heavily reflect the custom and traditional lifestyles of the native people. Building materials are simple, in contrast with the refined images of Dubai and Abu Dhabi today.

The Dubai government's decision to diversify from a trade-based but oil-reliant economy to one that is service- and tourism-oriented has made real estate and other developments more valuable, resulting in the property boom from 2004–2006. It was an attempt to promote the city's global image and combine traditional/local elements in such a way as to form completely new unrecognizable forms i.e. a new genre of design. Those architectural spectacles attract not only visitors from outside but also Emirati citizens/residents as well. Construction on a large scale has turned Dubai into one of the fastest-growing cities in the world. There are a number of large-scale projects which are currently under construction or will be constructed in the future. Due to the heavy construction which is taking place in Dubai, 30,000 construction cranes, which are 25% of cranes worldwide, are operating in

Dubai. Due to the burst of construction, Dubai has acquired various building-related records, which include: the world's tallest tower (Burj Khalifa), the world's largest shopping mall (Dubai Mall), the world's largest fountain (The Dubai Fountain) and the world's tallest hotel (Gevora Hotel). Also under construction is Dubai and, which will be almost twice the size of the Walt Disney World Resort.

In 2009, many construction real estate projects were suspended or abandoned, due to the worsening financial crisis of 2007–2010. That has also caused property prices to fall considerably throughout the United Arab Emirates, but most notably in Dubai. A Real Estate Regulatory Agency study found that over 200 projects had been cancelled between 2009 and 2011. In 2013 Prime Minister Sheikh Mohammed bin Rashid Al Maktoum created a committee to consider liquidating stalled building projects to pay off investors.

The Problem Area of this thesis: HH sheikh Mohammed bin Rashid al Maktoum then as Ruler and Chief Visionary of his Kingdom inaugurates many of the monuments he and his constituted committees have envisaged and approved in Design and Format bringing me to the question: Who designed Dubai or what role does the customer play in letting the architect arrive at the final destination of design. In many cases, architectural clients like the Sheikh and my example of the city of Dubai are not the only or even primary end-consumers. Architecture in Dubai is to give an example 'Prosumption Architecture. A creation of the Customer.

In general architecture is not void of participatory design initiatives, and in fact community driven design projects are relatively common. Not only that, every architectural initiative combines the Assigner and the Assigner. The Client gives the brief to the Architect to fulfil his (client's vision. There are independent charities that helps communities make architectural changes in their neighbourhoods. Members of the public, and non-profit institutions, are supported and guided in obtaining the resources or skills necessary to realise physical, spatial, and democratic change. The charity's work pivots on neighbourhood spaces, social housing, and community centres.

Crowdsourcing, is another outside innovation concept employed frequently in an architectural and commercial context. Many design competitions outsource proposals. The agenda here is wholly philanthropic, and therefore commercial viability is not demonstrated as competitive profit has not

been sought from any co-created architectural value. This distinction is important if such activities are to suggest an economic imperative, as they have in the commercial contexts described by Toffler, Tapscott, and other economic theorist of prosumption and co-creation.

Even open competitions for commercial architecture (which are comparatively rare) are often evaluated solely by panels of officials with no direct consumer influence. More crucially proposals seem to be generated by architects who are pressured to conceal creative ideas in order to maintain an advantage over competitors. As discussed, this typically automotive activity inevitably leads to the exclusion of co-creative consumers. Such competitions fit the term *crowdsource*, outlined by Jeff Howe (who coined the term in 2006), but evidently the act of crowdsourcing is not always participatory nor is it necessarily the same as co-creating value with consumers. This is a strikingly different form of outside innovation than the imperative described by Seybold in her book, "Outside Innovation". The Royal Institute of British Architects guidelines do not have 'designer' (reflecting those that work in product development, branding, fashion or game design) as a protected title in the UK and elsewhere, while 'architect' on the other hand is:

Architect

Having gained the Parts 1, 2 and 3 qualifications you can apply to register as an architect with the Architects Registration Board (ARB); the title 'architect' is protected by law, so that the public can always be sure that they are dealing with a properly qualified architect.
At this point you are eligible to become a Chartered Member of the RIBA. This gives you access to a wide range of services and benefits, and entitles you to become part of, and have influence over, a national and international network of architects. [1]

Perhaps this contributes to a corporate stigma that meaningful architectural solutions, ideas, or insights (ones that add tangible and competitive value to a firm) can only come from professional architects.

Microsoft's former VP, Andy Hart, once said "We're right to put people right at the heart of advertising" while referring to the company's efforts to change the way advertisements are formatted, by working directly with consumers. Brand design too has become an act of engaging consumer participation. Businesses are therefore finding value in the co-creation of their public appearance, but why is this not the case for the architecture of company's' intended urban icons?

Introduction-Prosumption as a pre-curser of customization: Following the increasing popularity of Web 2.0 technologies, such as Instagram, Facebook, Twitter and Flickr one important aspect in the service-dominant logic in marketing has been the increased role of customers as co-creators of value involving producing products for own consumption or "prosumption;" [2] blurring the line between production and consumption activities, with the consumer becoming a prosumer. This is a dot-com era business term meaning "production by consumers" referring to persons using commons-based peer production. Technological breakthroughs have hastened the development of prosumption. With the help of additive manufacturing techniques, for example, co-creation takes place at different production stages: design, manufacturing and distribution stages. It also takes place between individual customers, leading to co-design communities. Similarly, mass customisation is often associated with the production of tailored goods or services on a large-scale production.

This blurring of the roles of consumers and producers has its origins in the cooperative self-help movements that sprang up during various economic crises e.g. the Great Depression in the 1930s.Marshall McLuhan and Barrington Nevitt suggested in their 1972 book *Take Today*, (p. 4) that with electric technology, the consumer would become a producer). Toffler envisioned a highly saturated marketplace as mass production of standardized products began to satisfy basic consumer demands. To continue growing profit, businesses would initiate a process of mass customization, that is the mass production of highly customized products. However, to reach a high degree of customization, consumers would have to take part in the production process especially in specifying design requirements. The role of Co-creation adopted by customers lead to various economic, psychological and social benefits thus creating reciprocal value for organisations that embark on this partnership.[3]

In a sense, this was merely an extension or broadening of the kind of relationship that many affluent clients have had with professionals like architects for many decades. Toffler's ideas are having global impact and their reach becoming a salient characteristic of Web 2.0.
Prosumers create value for companies without receiving wages. Acknowledging and incorporating customers' skills and competencies has enabled businesses serve their customers more effectively and efficiently. Customer empowerment through adoption of modern technologies has further accelerated the process of joint value creation between firms and their customers. This transition

clearly emphasizes the growing importance of customers - conventionally thought of as passive recipients of value, and their resource contributions towards value creation.

Christian Greenrooms defined marketing as a customer focus that permeates organizational functions and processes and is geared towards making promises through value proposition, enabling the fulfilment of individual expectations created by such promises and fulfilling such expectations through support to customers' value-generating processes, thereby supporting value creation in the firm's as well as its customers'; and other stakeholders' processes to him. Service was a process that consist of activities that are more or less tangible. The activities are usually but not necessarily always taking place in the interaction between customer and service personnel, and/or physical resources or products and/or the system of the service provider. The service is a solution to a customer's problem. Participation of the customer into that service or marketing effort would solve the issues for both the organization and the customer- a win win situation.

Most economic areas have not witnessed this. One positive example was Food and beverage industry that offered a diversity of brand offerings at supermarkets and fast-food chains. Brand extension and dilution are ways companies have sold more under various names, giving consumers thousands of choices. Most consumption continues to be passive, as critics of television, recorded music, and fast food would argue. Indeed, people are generally uninterested in going to the effort of customizing the myriad products that comprise modern consumer culture. In *The Paradox of Choice: Why More is Less*, Barry Schwartz argues that diminishing returns from a confusing abundance of consumer choice is producing stress and dissatisfaction. Still, one key area of high-customization *is* taking place: highly involved hobbyists.

In the digital and online world, ”prosumer” is used to describe 21st-century online buyers because not only are they consumers of products, but they are able to produce their own products such as, customised handbags, jewellery with initials, jumpers with team logos etc. In the field of renewable energy, prosumers are households or organisations which at times produce surplus fuel or energy and feed it into a national (or local) distribution network; whilst at other times (when their fuel or energy requirements outstrip their own production of it) they consume that same fuel or energy from that grid. This is widely done by households by means of PV panels on their roofs generating electricity. Such households may additionally make use of battery storage to increase their share of self-

consumed PV electricity, referred to as prosumer in the literature. It is also done by businesses which produce biogas and feed it into a gas network while using gas from the same network at other times or in other places. The European Union's Nobel Grid project, which is part of their Horizon 2020 research and innovation programme, uses the term in this way, for example.
Considering the participation of the consumer in deciding the product Phillip Kotler expanded this term calling it the new challenge for marketers. He anticipated that people will also want to play larger role in designing certain goods and services they consume; furthermore, modern computers will permit them to do it. He also described several forces that would lead to more such activities. From a corporate perspective, it can be beneficial for a company to open up its processes to the end-users, integrating them. Such ideas can add to the Company's R & D resulting in stronger customer relations and faster feedback.

Organizations are increasingly utilizing and involving the end-users to develop final products and services. In some instances, end-users are creating products on their own, without the interference from or assistance of companies, organizations, etc. For example, Lego Mindstorms allows users to download software from Lego's website so that the users can edit and update software as they wish. A recent study showed that global values influence domain-specific values in food prosumption, and domain-specific values then affect attitudes, self-efficacy, and on-going behaviour before ultimately shaping intentions to engage in prosumption in the future. [4]

Prosumption in Design: Blanford has stated, the economic environment demands effective design the first time around and to safeguard the interests of future generations, and achieve environmental sustainability and energy optimization, there is need to incorporate mass awareness in product design. Designers and Architects need to scrutinize their responsibilities towards environmental problems by conducting life cycle assessment techniques making sustainable design an evolution and extension of traditional design.

Corporate clients may not currently demand co-creative architecture, but 21st century companies are continually springing up, utilising prosumption as a central business model. Perhaps it is only a matter of time until one of them decides to apply this logic in the brief for a 'revolutionary' retail establishment. As is the case with consumption in general, the outcome of such a project will be

difficult to predict – but perhaps this is the very point. To safeguard the interests of future generations, Sustainable Development is must. Product designers are facing energy challenges and are starting scrutinizing their responsibilities towards environmental problems by conducting life cycle assessment techniques. The use of sustainable or non-conventional product make the less impact on environment and sustain it for the long time. The goals of sustainable design are reducing or minimizing the use of non-renewable resources, managing renewable resources, Sustainable design should be an evolution and extension of traditional design approach. [5]

There is a 'feast or famine' cycle of the architectural design industry. Most of us know what it feels like to be price-shopped. Competitively priced. And have clients question architectural fees that it was a lot more than they expected. The constant strain - where the next architecture project will come from.

Therefore, involving the client. Listening to his ideas. Mulling over them and then making design suggestions seems like a sure shot strategy for success. Recently my friend designed a Farm House through an Architect and it won some awards for best design. When I met him, he invited me over to take a look and very proudly said that- "Komal (his wife) had presented most of the ideas to make this award winning farm house possible. Now, it is quite possible that this is true.[6] Or it may not be and he is trying to raise the intellectual and artistic level of his wife. But what about the next marketing scenario for the designer architect? Clients who liked this design will definitely come to him and clients who want their ideas to be valued because their money is going to be – will take a closure look at this firm.[7]

Was it not Hans Hoffman, artist and teacher, who said ***"Design is the intermediary between information and understanding."***

R E F E R E N C E S

1. Designers in UK are regulated by the DESIGN COUNCIL of UK (https://www.designcouncil.org.uk) & in India by the IIAA> Indian Institute of Architects But have no legal status as Architects do. According to the UK Council,

- Workers with design skills contribute £209bn to the UK economy (GVA).
- People who use design skills are 47% more productive than the average UK worker, delivering almost £10 extra per hour in GVA.
- 43% of workers using design skills are in jobs requiring and generating innovation, compared with an average for the wider UK workforce of just 6%.
- But we estimate that skills shortages and gaps amongst those already working in design-skilled occupations costs the UK economy £5.9bn per year.

2. In the 1980 book, The Third Wave, futurologist Alvin Toffler coined the term "prosumer" when he predicted that the role of producers and consumers would begin to blur and merge (even though he described it in his book Future Shock from 1970

3. Roles and Resource Contributions of Customers in Value Co-creation, Amit Kumar Agrawala, Zillur Rahmanba, ITERNATIONAL STRATEGIC MANAGEMENT REVIEW 3 (2015) 144–160

4. Trying to prosume: toward a theory of consumers as co-creators of value, Chunyan Xie,Richard P. Bagozzi,Sigurd V. Troye, Journal of the Academy of Marketing Science,2008, Volume 36, Issue 1, pp 109–122

5. Sustainable Product Design: A Review,Neelam Chaudhary, Tanvir Singh, Amit Kumar, IJECT Vol. Issue Spl-1, Jan - March 2014

6. Connecting Roots - Sudha & Sukesh Gandhi's Farmhouse, https://www.mgsarchitecture.in/architecture-design/projects/1224-connecting-roots-sudha-sukesh-gandhi-s-farmhouse-nagpur.html

7. This article is freely adopted from a number of sources but the small but inspiring spark has been : Lorimer, A. 'Prosumption Architecture: The Decentralization of Architectural Agency as an Economic Imperative', H+ Magazine, 2014, [online]

CHAPTER 13

The Architecture of Al Hambra

(al-Qal'at al-Ħamrā' = "the red fortress")

الْقَلْعَةُ ٱلْحَمْرَاءُ

From me you are welcomed morning and evening
by the tongues of blessing, prosperity, happiness and friendship¨
¨has decorated me with the robes of his glory and excellence
without disguise and has made me the throne of his empire
may its eminence be upheld by the master of divine glory and the celestial throne¨

Inscription on the walls
****

A B S T R A C T

The Alhambra complex in Granada, Spain is the most renowned building of the Islamic historical legacy and an enduring testimony to Islamic architecture on the European continent. Apart from that it is the only medieval palace in the world (not just Islamic) which has arrived intact to the present day. This paper examines the history and architectural morphology of this creation. And its place in what is known as ISLAMIC ARCHITECTURE. What is surprising is the dearth of literature about this renowned place in the on-line world.

Introduction: The Al Hambra or al-Qal'at al-Ḥamrā' - "the red fortress" an Arab citadel and palace situated in the Andalusian region of the State of Granada, Spain, is the most renowned building of the Islamic historical legacy-the astonishing achievements of Muslim scholars, scientists, craftsmen, and traders during the few hundred years or so that are called the Golden Age during 750 to 950 AD when the territory of the Muslim Empire encompassed present-day Iran, Syria, Iraq, Egypt, Palestine, North Africa, Spain, and parts of Turkey and drew to Baghdad; producing unparallel intellectual traditions. Apart from that it is the only medieval palace in the world (not just Islamic) which has arrived intact to the present day.It bears testimony to Islamic Conquests that disrupted the Christian European landscape and polity. Hence the importance of this citadel in this book on Disruption.

The beginning of Islamic conquests of what is known as Spain or Hispania (as it was called in those days) began on April 30, 711, Muslim General Tariq ibn-Ziyad landed at Gibraltar and by the end of the campaign most of the Iberian Peninsula were brought under Islamic rule. The importance of this region stems from the fact that many Andalusians participated in the expedition of Christopher Columbus on 3 August 1492 that ended up in the Europeans learning of the existence of the Americas which ended the Middle Ages and signalled the beginning of modernity. Contacts between Spain and the Americas, including royal administration and the shipping trade of Spanish colonies for over three hundred years, came almost exclusively through Andalusia. This conquestorial period lasted till the 10 year Granada war between 1482 and 1491, during the reign of the Catholic Christian monarchs Isabella I of Castile and Ferdinand II of Aragon, against the Islamic Nasrid dynasty's Emirate of Granada. It ended with the defeat of Granada and its annexation by Castile, ending all Islamic rule on the Iberian peninsula.

This romantic region’s, Granada's, most emblematic monument and one of the most visited in Spain is the walled city of Alhambra or "palace city" declared a World Heritage site by UNESCO in 1984. 740 metres (2,430 ft) in length by 205 metres (670 ft) at its greatest width, it extends from west-northwest to east-southeast and covers an area of about 142,000 square metres (1,530,000 sq ft) or 35 acres. Alhambra castle complex occupies a small plateau on the south-eastern border of the with buildings may have existed before the arrival of the Moors. On January 2, 1492, Muhammad XII of Granada (King Boabdil) surrendered the Emirate of Granada, the city of Granada, and the Alhambra palace to the Castilian forces.

The Alhambra’s architectural importance stems from the fact that it is a reflection of the culture of the last centuries of the Muslim rule of Al Andalus – the Andalusian region of Granada. Completed towards the end of Muslim rule of Spain by Muhammed V, Sultan of Granada (1353–1391. It is a place where artists and intellectuals had taken refuge. It is therefore a testament to Moorish culture in Spain and the skills of Muslim, Jewish, and Christian artisans, craftsmen, and builders of their era. It is said that Muhammad, the major builder of the complex, entered Granada in May 1238 dressed like a Sufi, in a plain wool

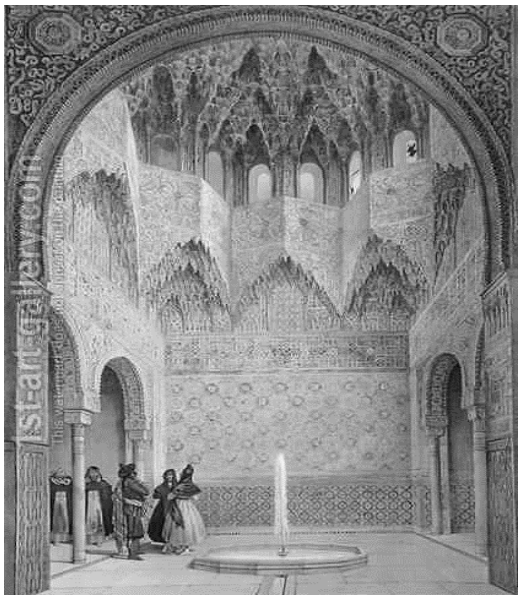
cap, coarse clothes and sandals, took up residence in the Castle (Al-cazaba) built by the Zirids in the 11th century; then inspected an area known as Al-Hamra, where there was a small fortress, and laid the foundations there for his future residence and fortress.

Soon work began on defensive structures, an irrigation dam, and a dike. The construction would last into the reigns of his successors, and the complex would be known as the Alhambra and would become the residence of all Nasrid rulers up to the surrender of Granada in 1492. The necessary funds for the construction of Alhambra were collected as Tax and also used money sent by the Hafsid ruler of Tunis—intended for defence against the Christians.

First reference: The first reference to the Qal'at al-Ḥamra was during the battles between the Arabs and the Muladies (people of mixed Arab and European descent) during the rule of the ʿAbdullah ibn Muhammad (r. 888–912). In one particularly fierce and bloody skirmish, the Muladies soundly defeated the Arabs, who were then forced to take shelter in a primitive red castle located in the province of Elvira, presently located in Granada. According to surviving documents from the era, the red castle was quite small, and its walls were not capable of deterring an army intent on conquering. The castle was then largely ignored until the eleventh century, when its ruins were renovated and rebuilt by Samuel ibn Naghrela, vizier to the emir Badis ben Habus of the Zirid Dynasty of Al Andalus, in an attempt to preserve the small Jewish settlement also located on the natural plateau, Sabikah Hill.

This year, 1238, **Abdallah ibn al-Ahmar** climbed to the place called "the Alhambra" inspected it, laid out the foundations of a castle and left someone in charge of its construction. The design included plans for six palaces, five of which were grouped in the northeast quadrant forming a royal quarter, two circuit towers, and numerous bathhouses. During the reign of the Nasrid Dynasty, the Alhambra was transformed into a palatine city, complete with an irrigation system composed of acequias for the gardens of the Generalife located outside the fortress. Previously, the old Alhambra structure had been dependent upon rainwater collected from a cistern and from what could be brought up from the Albaicín. The creation of the Sultan's Canal solidified the identity of the Alhambra as a palace-city rather than a defensive and ascetic structure. The hydraulic system includes two long water channels and several sophisticated elevation devices to bring water onto the plateau.

Preceding to this early on in the 11th century the Castle of the Alhambra had been developed as a walled town which became a military stronghold that dominated the whole city but the royal residence was established by Muhammad marking the beginning of its halcyon days. The Alhambra became palace, citadel and fortress, and was the residence of the Nasrid sultans and their senior officials, including servants of the court and elite soldiers (13th–14th centuries).Islamic rule in the Iberian peninsula lasted for varying periods ranging from only 28 years in the extreme northwest (Galicia) to 781 years in the area surrounding the city of Granada in the southeast. This Empire added contributions to society such as libraries, schools, public bathrooms, literature, poetry, and architecture. This work was mainly developed through the unification of people of all faiths.



The Alhambra is an example of Muslim art in its final European stages, relatively uninfluenced by the direct Byzantine influences found in the Mezquita of Córdoba. In 1492 the Catholic Monarchs, Ferdinand and Isabela, expelled the final Moors from the city of Granada establishing a permanent residency in the Alhambra, and it was here that Christopher Columbus requested royal endorsement for his westward expedition that year. The Catholic Monarchs altered some rooms of the Alhambra after the conquest of the city in 1492, yet in 1527 Charles V, Holy Roman Emperor wanted to construct a permanent residence befitting an emperor and demolished parts of the architectural

complex to build a Palace which bears his name, Charles V. Around 1537 he ordered the construction of the *Peinador de la Reina,* or Queen's dressing room, where his wife Isabel lived, over the Tower of Abu l-Hayyay.

TOPOGRAPHY: According to the site's current architect, Pedro Salmeron Escobar, the Alhambra evolved organically over a period of several centuries from the ancient hilltop fortress defined by a narrow promontory carved by the river Daro and overlooking the *Vega* or Plain of Granada as it descends from the Sierra Nevada. The red earth from which the fortress is constructed is a granular aggregate held together by a medium of red clay which gives the resulting layered brick- and stone-reinforced construction its characteristic hue and is at the root of the name of 'the Red Hill'

The palace and fortress complex located in was originally constructed as a small fortress in AD 889 on the remains of Roman fortifications, and then largely ignored until its ruins were renovated and rebuilt in the mid-13th century by the Nasrid emir Mohammed ben Al-Ahmar of the Granada, described above, who built its current palace and walls. It was converted into a royal palace in 1333 by Yusuf I, Sultan of Granada. After the conclusion of the Christian Reconquista in 1492, the site became the Royal Court of Ferdinand and Isabella (where Christopher Columbus received royal endorsement for his expedition), and the palaces were partially altered in the Renaissance style. In 1526 Charles I & V commissioned a new Renaissance palace better befitting the Holy Roman Emperor in the revolutionary Mannerist style influenced by humanist philosophy in direct juxtaposition with the Nasrid Andalusian architecture, but it was ultimately never completed due to Morisco rebellions in Granada.

Alhambra's last flowering of Islamic palaces was built for the last Muslim emirs in Spain during the decline of the Nasrid dynasty, who were increasingly subject to the Christian Kings of Castile. After being allowed to fall into disrepair for centuries, the buildings occupied by squatters, Alhambra was rediscovered following the defeat of Napoleon, who had conducted retaliatory destruction of the site. The rediscoverers were first British intellectuals and then other north European Romantic travelers. It is now one of Spain's major tourist attractions, exhibiting the country's most significant and well-known Islamic architecture, together with 16th-century and later Christian building and garden interventions. The Alhambra is a UNESCO World Heritage Site and the inspiration for many songs and stories.

What the Moorish poets described as "a pearl set in emeralds", (an allusion to the red color of its buildings and the woods around them) was designed with the mountainous site in mind and many

forms of technology were considered. The Moors planted -Alameda de la Alhambra-the park with roses and when overgrown it is covered with wildflowers and grass in the spring, and roses, oranges, and myrtles. Its most characteristic feature today, however, is the dense wood of English elms brought by the Duke of Wellington in 1812.The park has a multitude of nightingales and is usually filled with the sound of running water from several fountains and cascades. These are supplied through a conduit 8 km (5.0 mi) long, which is connected with the Darro at the monastery of Jesus Del Valle above Granada.

Despite long neglect, willful vandalism, and some ill-judged restoration, the Alhambra endures as an atypical example of Islamic influenced architecture no matter that later Catholic rulers left their impressions on the architectural texture of the expansions of these grand dwellings. The Emirate of Granada which Muhammad founded, and the Nasrid royal house, lasted for two more centuries until it was annexed by Castile in 1492. His other legacy was the construction of the Alhambra, his residence in Granada. His successors would continue to build the palace and fortress complex and reside there, and it has lasted to the present day as the architectural legacy of the emirate.

Most of the palace buildings are quadrangular in plan, with all the rooms opening on to a central court, and the whole reached its present size simply by the gradual addition of new quadrangles, designed on the same principle, though varying in dimensions, and connected with each other by smaller rooms and passages. Alhambra was extended by the different Muslim rulers who lived in the complex. However, each new section that was added followed the consistent theme of "paradise on earth". Column arcades, fountains with running water, and reflecting pools were used to add to the aesthetic and functional complexity. In every case, the exterior was left plain and austere. Sun and wind were freely admitted. Blue, red, and a golden yellow, all somewhat faded through lapse of time and exposure, are the colors chiefly employed. The name Alhambra means the red one or the red castle, which refers to the sun-dried bricks that the outer wall is made of.

The decoration consists for the upper part of the walls, as a rule, of Arabic inscriptions—mostly poems by Ibn Zamrak and others praising the palace—that are manipulated into geometrical patterns with vegetal background set onto an arabesque setting ("Ataurique"). Much of this ornament is carved stucco (plaster) rather than stone. Tile mosaics ("alicatado"), with complicated mathematical patterns ("tracería", most precisely "lacería"), are largely used as panelling for the lower part. Metal was also not present very mainly. Similar designs are displayed on wooden ceilings

(Alfarje). Muqarnas are the main elements for vaulting with stucco, and some of the most accomplished dome examples of this kind are in the Court of the Lions halls. The palace complex is designed in the Nasrid style, the last blooming of Islamic Art in the Iberian Peninsula, that had a great influence on the Maghreb to the present day, and on contemporary Mudejar Art, which is characteristic of western elements reinterpreted into Islamic forms and widely popular during the Reconquista in Spain.

Decorations: The decoration within the palaces comes from the last great period of Andalusian art in Granada. With little of the Byzantine influence of contemporary Abassid architecture, artists endlessly reproduced the same forms and trends, creating a new style that developed over the course of the Nasrid Dynasty. The Nasrids used freely all the stylistic elements that had been created and developed during eight centuries of Muslim rule in the Peninsula, including the Caliphate horseshoe arch, the Almohad sebka (a grid of rhombuses), the Almoravid palm, and unique combinations of them, as well as innovations such as stilted arches and muqarnas (stalactite ceiling decorations). Structurally, the design is simple and does not evince significant innovation. While artistically pleasing it was until the reconquest structurally ad hoc and reliant on the skills of subject artisans and workers.Columns and muqarnas appear in several chambers, and the interiors of numerous palaces are decorated with arabesques and calligraphy. The arabesques of the interior are ascribed to, among other sultans, Yusuf I, Mohammed V, and Ismail I, Sultan of Granada. However, after the Christian conquest of the city in 1492, the conquerors began to alter the Alhambra. The open work was filled up with whitewash, the painting and gilding effaced, and the furniture soiled, torn, or removed.[3] Charles I (1516–1556) rebuilt portions in the Renaissance style of the period and destroyed the greater part of the winter palace to make room for a Renaissance-style structure which was never completed. Philip V (1700–1746) Italianized the rooms and completed his palace in the middle of what had been the Moorish building; he had partitions constructed which blocked up whole apartments.

This crude earthiness is counterpointed by the startling fine alabaster white stucco work of the famous interiors Meltwater from the 'Snowy Mountains' is drawn across an arched vault at the eastern tip of the *Torre del Agua* ('Water Tower') and channeled through the citadel via a complex system of conduits (*acequia*) and water tanks (*los albercones*) which create the celebrated interplay of light, sound and surface.

Alhambra is about 740 meters (2,430 ft) in length by 205 meters (670 ft) at its greatest width. It extends from west-northwest to east-southeast and covers an area of about 142,000 square meters (1,530,000 sq. ft) or 35 acres. The Alhambra's most westerly feature is the Alcavala (citadel), a strongly fortified position built to protect the original post-Roman districts of *Iliberri*, now 'Centro', and *Gárnata al-yahūd* ('Granada of the Jews', now *Realejo*, and the Moorish suburb of *El Albayzín*.

Due to touristic demand, modern access runs contrary to the original sequence which began from a principal access via the *Puerta de la Justicia* (Gate of Justice) onto a large souk or public market square facing the Alcazaba, now subdivided and obscured by later Christian-era development.[8] From the *Puerta del Vino* (Wine Gate) ran the *Calle Real* (Royal Street) dividing the Alhambra along its axial spine into a southern residential quarter, with mosques, hammams (bathhouses) and diverse functional establishments, and a greater northern portion, occupied by several palaces of the nobility with extensive landscaped gardens commanding views over the Albayzin. All of this was subservient to the great Tower of the Ambassadors in the *Palacio Comares*, which acted as the royal audience chamber and throne room with its three arched windows dominating the city. The private, internalized universe of the *Palacio de Los Leones* (Palace of the Lions) adjoins the public spaces at right angles (see Plan illustration) but was originally connected only by the function of the Royal Baths, the Eye of Aixa's Room serving as the exquisitely decorated focus of meditation and authority overlooking the refined garden of *Lindaraja/Daraxa* toward the city.

The rest of the plateau comprises a number of earlier and later Moorish palaces, enclosed by a fortified wall, with thirteen defensive towers, some such as the *Torres de la Infanta* and *Cattiva* containing elaborate vertical palaces in miniature. The river Darro passes through a ravine on the north and divides the plateau from the Albaicín district of Granada. Similarly, the Assabica Valley, containing the Alhambra Park, lies on the west and south, and, beyond this valley, the almost parallel ridge of Monte Mauror separates it from the Antequeruela district. Another ravine separates it from the Generalife, the summer pleasure gardens of the emir. Escobar notes that the later planting of deciduous elms obscures the overall perception of the layout, so a better reading of the original landscape is given in winter when the trees are bare.

Main Structure: The Alhambra resembles many medieval Christian strongholds in its threefold arrangement as a castle, a palace and a residential annex for subordinates. The alcazaba or citadel, its

oldest part, is built on the isolated and precipitous foreland which terminates the plateau on the northwest. All that remains are its massive outer walls, towers and ramparts. On its watchtower, the 25 m (85 ft) high *Torre de la Vela*, the flag of Ferdinand and Isabella was first raised as a symbol of the Spanish conquest of Granada on 2 January 1492.[3] A turret containing a large bell was added in the 18th century and restored after being damaged by lightning in 1881. Beyond the Alcazaba is the palace of the Moorish rulers, The Nasrid Palaces or Alhambra proper, and beyond this is the Alhambra Alta (Upper Alhambra), originally occupied by officials and courtiers.

Access from the city to the Alhambra Park is afforded by the *Puerta de las Granadas* (Gate of Pomegranates), a triumphal arch dating from the 15th century. A steep ascent leads past the Pillar of Charles V, a fountain erected in 1554, to the main entrance of the Alhambra. This is the *Puerta de la Justicia* (Gate of Justice), a massive horseshoe archway surmounted by a square tower and used by the Moors as an informal court of justice. The hand of Fatima, with fingers outstretched as a talisman against the evil eye, is carved above this gate on the exterior; a key, the symbol of authority, occupies the corresponding place on the interior. A narrow passage leads inward to the *Plaza de los Aljibes* (Place of the Cisterns), a broad open space which divides the Alcazaba from the Moorish palace. To the left of the passage rises the *Torre del Vino* (Wine Tower), built in 1345 and used in the 16th century as a cellar. On the right is the palace of Charles V, a smaller Renaissance building, to construct which part of the Alhambra, including the original main entrance, was torn down.

Jennat al Arif **-**Generalife**-** It is the outlying set of buildings connected to the Alhambra, of which the foremost is the Palacio de Generalife or Gineralife (the Muslim *Jennat al Arif*, "Garden of Arif," or "Garden of the Architect"). This villa dates from the beginning of the 14th century but has been restored several times. The *Villa de los Martires* (Martyrs' Villa), on the summit of Monte Mauror, commemorates by its name the Christian slaves who were forced to build the Alhambra and confined here in subterranean cells.[17] The *Torres Bermejas* (Vermilion Towers), also on Monte Mauror, are a well-preserved Moorish fortification, with underground cisterns, stables, and accommodation for a garrison of 200 men. Several Roman tombs were discovered in 1829 and 1857 at the base of Monte Mauror.

Pools in the Palacio de Generalife (*left*) and the Partal (*right*; in the *Alta Alhambra* of the complex)

Plaza de Nazaríes Royal complex Courtyard of the Palace of Charles V is the second largest and important structure consisting of three main parts: Mexuar,Serallo and the Harem. The Mexuar is modest in decor and houses the functional areas for conducting business and administration. Strapwork is used to decorate the surfaces in Mexuar. The ceilings, floors, and trim are made of dark wood and are in sharp contrast to white, plaster walls. Serallo, built during the reign of Yusuf I in the 14th century, contains the Patio de los Arrayanes (Court of the Myrtles). Brightly colored interiors featured *dado* panels, *yesería*, *azulejo*, cedar, and *artesonado*. Artesonado are highly decorative ceilings and other woodwork. Lastly, the Harem is also elaborately decorated and contains the living quarters for the wives and mistresses of the Arab monarchs. This area contains a bathroom with running water (cold and hot), baths, and pressurized water for showering. The bathrooms were open to the elements in order to allow in light and air.

The *Patio de los Arrayanes* - Court of the Myrtles The present entrance to the *Palacio Árabe* (Arab palace), or *Casa Real*, is by a small door from which a corridor connects to (Court of the Myrtles), also called the *Patio de la Alberca* (Court of the Blessing or Court of the Pond), from the Arabic *birka*, "pool". The Birke helped to cool the palace and acted as a symbol of power. Because water was usually in short supply, the technology required to keep these pools full was expensive and difficult. This court is 42 m (140 ft) long by 22 m (74 ft) broad, and in the center, there is a large pond set in the marble pavement, full of goldfish, and with myrtles growing along its sides. There are galleries on the north and south sides; the southern gallery is 7 m (23 ft) high and supported by a marble colonnade. Underneath it, to the right, was the principal entrance, and over it are three windows with arches and miniature pillars. From this court, the walls of the *Torre de Comares* are seen rising over the roof to the north and reflected in the pond

The *Patio de los Leones* - The Court of the Lions, an example of Islamic Moorish architecture and garden design. or Courtyard of the Lions was built then. Now this is the most emblematic part of the Alhambra. It is an oblong courtyard, (35 m) in length by 66 ft (20 m) in width, surrounded by a low gallery supported on 124 white marble columns. A pavilion projects into the court at each extremity, with filigree walls and a light domed roof. The square is paved with colored tiles and the colonnade with white marble, while the walls are covered 5 ft (1.5 m) up from the ground with blue and yellow tiles, with a border above and below of enameled blue and gold. The columns supporting the roof and gallery are irregularly placed. They are adorned by varieties of foliage, etc.; about each arch there is a large square of stucco arabesques; and over the pillars is another stucco square of filigree work. It lies

in the center of the court and is an alabaster basin supported by the figures of twelve lions in white marble, not designed with sculptural accuracy but as symbols of strength, power, and sovereignty. Each hour one lion would produce water from its mouth. At the edge of the great fountain there is a poem written by Ibn Zamrak. This praises the beauty of the fountain and the power of the lions, but it also describes their ingenious hydraulic systems and how they actually worked, which baffled all those who saw them. Around the 1360´s is when the palace as we know today really begins to develop. This fountain is said to represent the heavenly garden of Islam. A large bowl sits on twelve lions; each one has its own individual markings and face. Underneath the base of Lion´s fountain run four water channels. These streams symbolize the four rivers of paradise. Each of the twelve lions spout water into channels below which run across the marble courtyard, creating movement and sounds across the centre of the palace. **The Hall of the Two Sisters** is adjoining room to the Court. Decorated poems specifically for the space had been in scripted on the walls-probably by the court poet Ibn Zamrak, (1333-1393). With verse wrapped around the impressive walls. This room off the Courtyard of the Lions has two huge marble flagstones on the floor. They have the same dimensions on either side of the entrance. This white stone is from the town of Macael in Almeria. I´m sure that it was quite an ordeal moving these huge flagstones almost 200 kilometres in those days. The ceiling in this room is breath-taking. Inside the white plasterwork creates a dramatic effect. These shapes are *muqarnas* or a three-dimensional decoration of Islamic architecture initially built to be structural in purpose made out of stone, but here they became crafted decoration to decorate the area between the wall and the dome.

Sala de los Abencerrajes -The Hall of the Abencerrages is so named from a legend according to which the father of Boabdil, the last sultan of Granada, having invited the chiefs of that line to a banquet, massacred them there. This room is a perfect square, with a lofty dome and trellised windows at its base. The roof is decorated in blue, brown, red and gold, and the columns supporting it spring out into the arch form in a remarkably beautiful manner. Opposite to this hall is the *Sala de las dos Hermanas* (Hall of the two Sisters), so-called from two white marble slabs laid as part of the pavement. These slabs measure 500 by 220 cm (15 by 7½ ft). There is a fountain in the middle of this hall, and the roof — a dome honeycombed with tiny cells, all different, and said to number 5000 — is an example of the "stalactite vaulting" of the Moors.

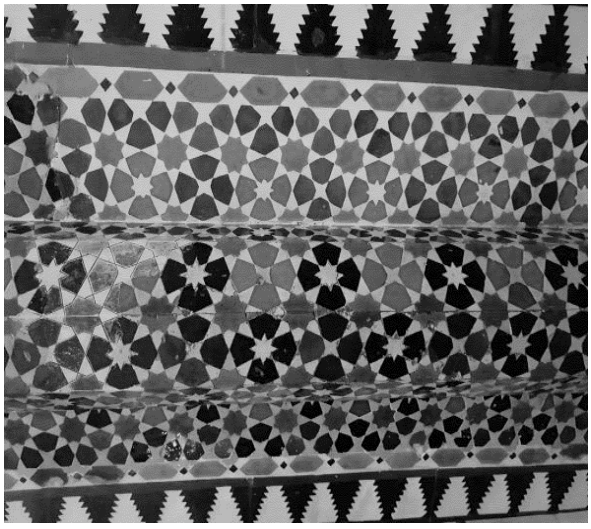
"Honeycomb," "stalactite," or "moçárabe" vaulting in the Hall of the Abencerrajes

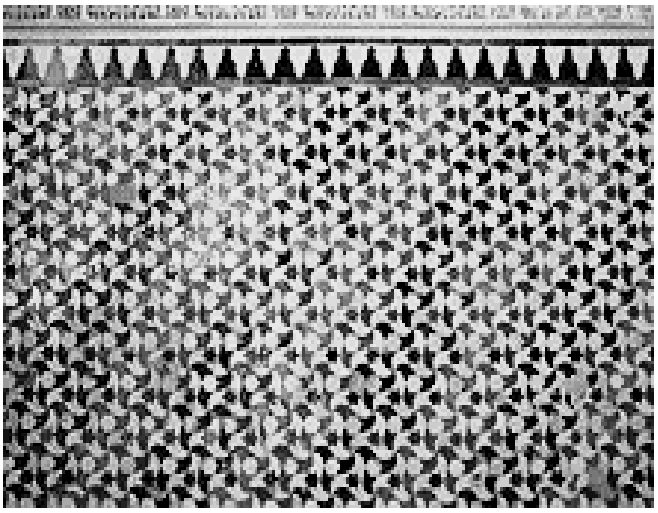
Athath almanzil-Furniture: The famous Alhambra vases, very large Hispano-Moresque ware vases made in the Sultanate are the original furniture of the palace. These famous examples of Hispano-Moresque ware date from the 14th and 15th centuries. The one remaining in the palace, from about 1400, is 1.3 m (4 ft 3 in) high; the background is white and the decoration is blue, white and gold.

Nasrid shell vase in the Alhambra

Mathematics in Design: Water and geometry are the main design elements in the Alhambra

The maze-like corridors of the palace, have many walls covered in brightly coloured ceramic tiles. The tiles cover half of the walls. The Alhambra tiles are remarkable in that they contain nearly all, if not all, of the seventeen mathematically possible wallpaper groups. This is a unique accomplishment in world architecture. M. C. Escher's visit in 1922 and study of the Moorish use of symmetries in the Alhambra tiles inspired his subsequent work on tessellation, which he called "regular divisions of the plane" As this historic period is of great importance, we can still see coloured tiles across Andalusia today. These tiles apart from being decorative, keep walls cooler in summertime and protect them too. Tiling done with mathematical precision was intended to be aesthetically pleasing. Geometrical calculations were used in the tile patterns creating an infinite design to cover as much distance as needed for each space**.**

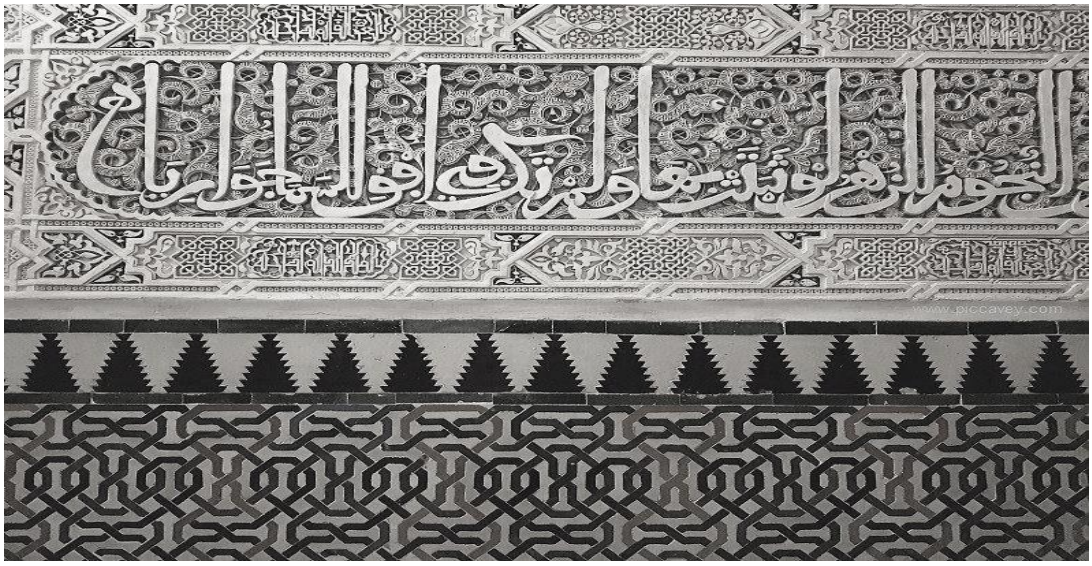




1. All those centuries ago the colours of the tiles were created with these materials:
2. Blue – Cobalt
3. Purple or Black -Manganese
4. Green – Iron
5. Red or Green- Copper
6. White – Tin
7. Yellow – Lead or Antimony

Above the tiles, higher up towards the walls geometrical shapes or poetic inscriptions abound. Towards the top of the walls quotations from the Koran appear, intentionally situated far from the ground.

The *Salón de los Embajadores* - The design of this throne room is based on many square shapes. Consequently, Mathematicians and architects appreciate this room due to its symmetry and precision. The room is said to have had brightly coloured rugs, beautiful vases and musical instruments around in earlier times. It occupies all the *Torre de Comares*. It is a square room, the sides being 12 m (37 ft) in length, while the center of the dome is 23 m (75 ft) high. This was the grand reception room, and the throne of the sultan was placed opposite the entrance. The grand hall projects from the walls of the palace, providing views in three directions. In this sense, it was a "mirador"- a turret or tower attached to a building and providing an extensive view from which the palace's inhabitants could gaze outward to the surrounding landscape. The tiles are nearly 4 ft (1.2 m) high all round, and the colors vary at intervals. Over them is a series of oval medallions with inscriptions, interwoven with flowers and leaves. There are nine windows, three on each facade, and the ceiling is decorated with white, blue and gold inlays in the shape of circles, crowns and stars. The walls are covered with varied stucco works, surrounding many ancient escutcheons.



Inscriptions: Some inscriptions are beautiful poetry whereas others provide information on construction dates of building within the Alhambra.

Even more inscriptions cover phrases such as "*There is no victor but Allah"* which appears many times. Also recurring words like "happiness" or "blessing" appear often throughout the palace. These words are there to protect the monarch honoured in each courtyard.

Similarly, other phrases appear such as: "*Rejoice in good fortune, because Allah helps you*" or "*Be sparse in words and you will go in peace*." It seems like the men choosing these texts for the palace walls were poets but also politicians. This wall decoration was an elaborate form of political propaganda. These palace officials reflected the authority and power of the Sultan. Visible to anyone entering the rooms at the heart of the Al Andalus kingdom**.** Abundant inscriptions were added year by year. Such as the one in the Throne room:

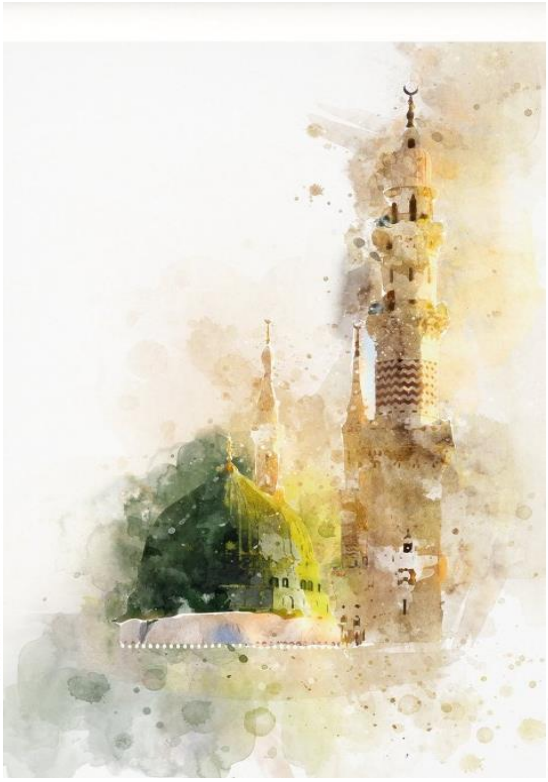
¨From me you are welcomed morning and evening
by the tongues of blessing, prosperity, happiness and friendship¨
¨has decorated me with the robes of his glory and excellence
without disguise and has made me the throne of his empire
may its eminence be upheld by the master of divine glory and the celestial throne¨

Starry Ceilings: The intricate cedar wood ceiling has exacting measurements. Extremely difficult to put into place it consists of 8017 multicoloured panels. Symbolizing the seven heavens of Islamic Paradise. Diagonal lines radiate from the centre representing the four trees of life. The ceiling is decorated with lots of stars. Painted to shine like ivory, mother of pearl and silver. Also, worth noticing is the difference between the 8 pointed and 16 pointed stars. Most of the room would have been in a dim light, ensuring cooler temperatures. the latticework on the windows allows filtered light into the room. The effect of the light from the windows shone around the throne. This would surround the sultan in diffused light in a dim room creating a position of power and mystery. The throne would be set upon something to give it height too.

Last word: The Alhambra is the best example of Islam architecture in Europe. It took many months and years of work to decorate the palace interiors. One of the inscripted poems best describes this architectural feat:

The portico is so beautiful that the palace
competes in beauty with the sky.
You dressed it with such an exquisite lamé,
that the loom of the Yemen is forgotten.
¡How many arches are high on its summit,
on the columns that are adorned by the light,
like spheres that turn
above the glowing pillar of the dawn!
The columns are so beautiful in every way,
that their success flies from mouth to ear:
the marble throws its clear light, which invades
the black corner that blackens the shadow;
its highlights iridesce, and one would say that
they are, in spite of their size, pearls.

C H A P T E R 14



Medina Architecture of
Al-Masjid an-Nabawī – TheMosque of the Prophet

بَنَى مَنْ وَسَلَّمَ عَلَيْهِ اللَّهُ صَلَّى اللَّهِ رَسُولُ قَالَ قَالَ عَفَّانَ بْن عُثْمَانَ عَنْ
مِثْلَهُ الْجَنَّةِ فِي لَهُ اللَّهُ بَنَى لِلَّهِ مَسْجِدًا

“Whoever builds a mosque for God, even the size of a sand-grouse nest, based on piety, [God will build for him a palace in Paradise].”
The Prophet(blessings and peace be upon him)

A B S T R A C T

The Prophet's Mosque is one of the largest mosques in the world and the second holiest site in Islam after the Grand Mosque in Makkah. Located in Madinah, it was built by Prophet Muhammad in the year 1 AH (622 AD) near his home after building the Quba Mosque,the first mosque in Islam at Mecca. The mosque was expanded many times over the years, in the reign of the Caliphs and the Umayyad, Abbasid and Ottoman states, and then finally in the span of the Kingdom of Saudi Arabia in 1994 when the largest expansion operation took place. The Prophet's Mosque is considered to be the first place in the Arabian Peninsula to be lit electrically using light-bulbs in 1327 AH (1909). The original mosque was an open-air building, and served as a community center, a Court and a religious school. The mosque is also home to the tomb of Prophet Muhammad and it is a significant Islamic site to pilgrims for its strong affiliation and connection to the life of the Prophet.

Many pilgrims who perform Hajj also travel to Al-Madinah to visit the Prophet's mosque to performed the ritual of "Itikaaf" (Seclusion and staying in the mosque with the intention of worshipping). Many hotels and local/traditional markets can be found near the mosque. One of the mosque's most prominent features is the Green Dome; it is built above the prophet's tomb and the tombs of early Muslim caliphs Abu Bakr As-Siddiq and Omar bin Al-Khattab. The Green Dome is in the south east corner of the Prophet's Mosque, and was first painted green in 1837, becoming known thereafter as "The Green Dome."

al-Madīnah al-Munawwarah
Medina-The Enlightened City

The Life of the Prophet: The life of the prophet Muhammad has a direct bearing on the mosque at Medina. His birth and presence marks the beginning of the greatest disruption in the history of manking the- Birth of Islam and its spread all over the world burying the earlier existing idolatry (ic) religions. The evolution of the concept of mosques as propounded by the Prophet also took place with the first and second mosques.This marked the birth of mosques and the innovation of it as a house for the followers.

His life was full of challenges and it is believed that the God was testing him for an onerous task that would be bestowed upon him later on. His father, Abdullah, died almost six months before Muhammad was born. According to Islamic tradition, Muhammad was sent to live with a Bedouin family in the desert, as desert life was considered healthier for infants. Muhammad stayed with his foster mother, Halimah bint Abi Dhuayb, and her husband until he was two years old. At the age of six, Muhammad lost his biological mother, Amina, to illness and was raised by his paternal grandfather, Abd al-Muttalib, until he died when Muhammad was eight. He then came under the care of his uncle Abu Talib, the new leader of Banu Hashim.

Adolescence and Early Adulthood

While still in his teens, Muhammad accompanied his uncle on trading journeys to Syria, gaining experience in commercial trade, which was the only career open to him as an orphan. Islamic tradition states that when Muhammad was either nine or twelve, while accompanying a caravan to Syria he met a Christian monk or hermit named Bahira, who is said to have foreseen Muhammed's career as a prophet of God. As available information is fragmented, it is difficult to separate history from legend and so little is known of Muhammad during his later youth; but it is said that he became a merchant and "was involved in trade between the Indian ocean and the Mediterranean Sea." Due to his upright character during this time, he acquired the nickname "al-Amin," meaning "faithful, trustworthy," and "al-Sadiq," meaning "truthful."

Muhammad worked as a trader for Khadija, a widow, until he married her in 595 CE at the age of 25. The marriage lasted for 25 years and was reported to be a happy one. Muhammad relied upon Khadija and did not enter into a marriage with another woman during his first marriage. After Khadija's death, Khawla bint Hakim suggested that Muhammad that should marry Sawda bint Zama, a Muslim widow, or Aisha, daughter of Um Ruman and Abu Bakr of Mecca. Muhammad is said to have asked for arrangements to marry both. He unified Arabia into a single religious polity under Islam. Muslims and Bahá'ís believe he is a messenger and prophet of God. The Hegira or Hijrah, is the migration or journey of the Islamic prophet Muhammad and his followers from Mecca to Medina, in the year 622.The Quran, the central religious text in Islam, alludes to Muhammad's life which is traditionally defined into two periods: pre-hijra (emigration) in Mecca (from 570 to 622 CE) and post-hijra in Medina (from 622 until 632 CE). While non-Muslims regard Muhammad as the founder of Islam, Muslims consider him to have restored the unaltered original monotheistic faith of Adam, Noah, Abraham, Moses, Jesus, and other prophets.

Muhammad's First Revelations

According to Muslim tradition, Muhammad's wife Khadija was the first to believe he was a prophet. She was followed by Muhammad's ten-year-old cousin Ali ibn Abi Talib, close friend Abu Bakr, and adopted son Zaid. Around 613, Muhammad began to preach to the public. Most Meccans ignored and mocked him, but he did begin to gain followers. As Islam spread in Mecca, the ruling tribes began to oppose Muhammad's preaching and his condemnation of idolatry. In 622 CE, Muhammad and his followers migrated to Medina in the Hijra to escape persecution, renaming the city Medina in honour of the prophet. Among the first things Muhammad did to ease the longstanding grievances among the tribes of Medina was draft a document known as the Constitution of Medina.

Opposition in Mecca

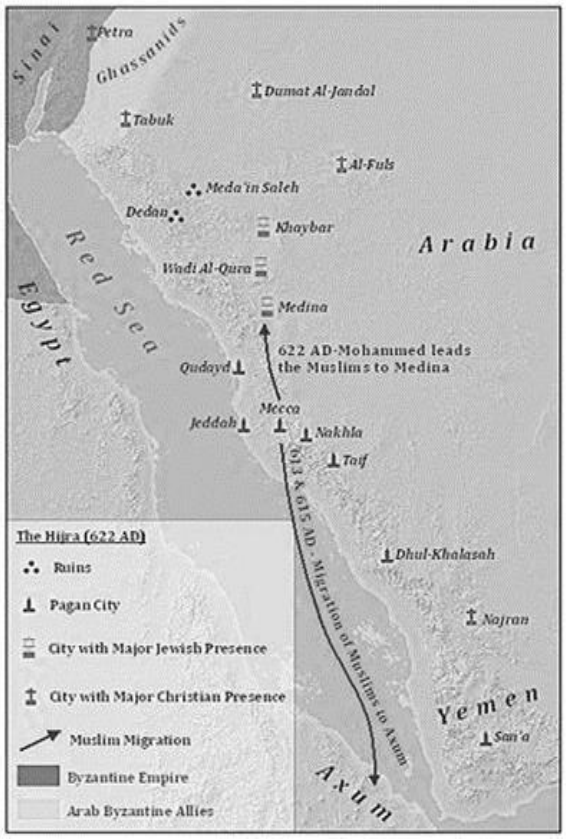
According to Ibn Sad, one of Muhammad's companions, the opposition in Mecca started when Muhammad delivered verses that condemned idol worship and polytheism. The ruling tribes of Mecca perceived Muhammad as a danger that might cause tensions similar to the rivalry of Judaism and Bedouin Polytheism in Yathrib (latger to be named medina). The powerful merchants in Mecca attempted to convince Muhammad to abandon his preaching by offering him admission into the inner circle of merchants and an advantageous marriage. However, Muhammad turned down both offers.

At first, the opposition was confined to ridicule and sarcasm, but later morphed into active persecution. The clan's protection from Muhammad was withdrawn in Mecca, endangering him and his followers. Muhammad took this opportunity to look for a new home for himself and his followers. After several unsuccessful negotiations, he found hope with some men from Yathrib (later called Medina). The Arab population of Yathrib were familiar with monotheism and were prepared for the appearance of a prophet because a Jewish community existed there as well. They also hoped, by the means of Muhammad and the new faith, to gain supremacy over Mecca; the Yathrib were jealous of its importance as the place of pilgrimage. Converts to Islam came from nearly all Arab tribes in Medina; by June of the subsequent year, seventy-five Muslims came to Mecca for pilgrimage and to meet Muhammad. A delegation from Medina, consisting of the representatives of the twelve important clans of Medina, invited Muhammad as a neutral outsider to serve as the chief arbitrator for the entire community. They pledged themselves and their fellow citizens to accept Muhammad into their community and physically protect him as one of their own.

The Hijra in 622 CE

The Hijra is the migration of Muhammad and his followers from Mecca to Medina, 320 kilometers (200 miles) north, in 622 CE. This marks an important point in the history of Islam. Muhammad had earlier on, instructed his followers to immigrate to Medina until nearly all of them left Mecca. According to tradition, the Meccans, alarmed at the departure, plotted to assassinate Muhammad. In June 622, when he was warned of the plot, Muhammad slipped out of Mecca with his friend Abu Bakr. He stopped at a place called Quba, some miles from the main city, and established a mosque there. After a fourteen-days stay at Quba, Muhammad started for Medina, participating in his first Friday prayer on the way, and upon reaching the city was greeted cordially.

The 1st Mosque built by the Prophet at Quba



Madinah is also known as *Madinah An-Nabi* (The City of the Prophet) or *Madinah Al-Munawwarah* (The Enlightened City), or Medina. In ancient times, the city was known as Yathrib. Located 450 kilometers (200+ miles) north of Makkah, Yathrib was an agricultural center in the harsh desert landscape of the Arabian Peninsula. Blessed with an abundant water supply, the city of Yathrib became a stopping point for caravans passing through, and its citizens were heavily involved in trade. So significant was this migration that the Islamic calendar begins counting time from the year of the Hijrah.

Upon arrival in Madinah, one of the first things the Prophet Muhammad wished to do was build a mosque. The story is told that the Prophet Muhammad let his camel loose, and waited to see where it would wander and then stop to rest. The place where the camel stopped was selected as the location of the mosque, which is known as the "Prophet's Mosque" (*Masjed An-Nawabi*). The entire Muslim community (original residents of Madinah, as well as the migrants who had moved from Makkah) came together to help build the mosque out of mud bricks and tree trunks. The Prophet Muhammad's apartment was constructed on the eastern side, adjacent to the mosque.

The new mosque soon became the center of the city's religious, political, and economic life. Throughout Islamic history, the mosque has been expanded and improved upon, until it is now 100 times larger than its original size and can accommodate more than half a million worshippers at a time. A large green dome now covers the Prophet Muhammad's residential quarters, where he is buried along with the first two Caliphs, Abu Bakr and Omar. Over two million Muslim pilgrims visit the Prophet's Mosque each year.

Al-Masjid an-Nabawī : ٱلْمَسْجِد ٱلنَّبَوِي is a mosque established and built by the Islamic prophet Muhammad, situated in the city of Medina in the Hejaz region of Saudi Arabia. It is one of the first mosques built by Muhammad, and is now one of the largest mosques in the world. It is the second-holiest site in Islam, after the Great Mosque in Mecca.It is always open, regardless of date or time.

The site was originally adjacent to Muhammad's house; he settled there after his migration from Mecca to Medina in 622. He shared in the heavy work of construction. The original mosque was an open-air building. The mosque served as a community center, a court, and a religious school. There

was a raised platform for the people who taught the Quran. Subsequent Islamic rulers greatly expanded and decorated it. In 1909, it became the first place in the Arabian Peninsula to be provided with electrical lights.[4] The mosque is under the control of the Custodian of the Two Holy Mosques. The mosque is located in what was traditionally the center of Medina, with many hotels and old markets nearby. It is a major pilgrimage site. Many pilgrims who perform the Hajj go on to Medina to visit the mosque, due to its connection to Muhammad.

After an expansion during the reign of the Umayyad caliph Al-Walid I, it now incorporates the final resting place of Muhammad and the first two Rashidun caliphs Abu Bakr and Umar. One of the most notable features of the site is the Green Dome in the south-east corner of the mosque, originally Aisha's house, where the tomb of Muhammad is located. In 1279, a wooden cupola was built over the tomb which was later rebuilt and renovated multiple times in late 15th century and once in 1817. The current dome was added in 1818 by the Ottoman sultan Mahmud II, and it was first painted green in 1837, hence becoming known as the "Green Dome".It is made with limestone.

The mosque was built by Muhammad in the first year of the Hijrah (c. 622 CE), after his arrival in Medina. Riding on a camel called Qaswa he arrived at the place where this mosque was built. The land was owned by Sahal and Suhayl, partly as a place for drying dates, and at one end had been previously used as a burial ground. Refusing to "accept the land as a gift", he bought the land and it took seven months to complete the construction of the mosque. It measured 30.5 m × 35.62 m (100.1 ft × 116.9 ft).[8] The roof which was supported by palm trunks was made of beaten clay and palm leaves. It was at a height of 3.60 m (11.8 ft). The three doors of the mosque were Bab-al-Rahmah to the south, Bab-al-Jibril to the west and Babal-Nisa to the east.

After the Battle of Khaybar, the mosque was "enlarged".The mosque extended for 47.32 m (155.2 ft) on each side and three rows of columns were built beside the west wall, which became the place of praying.

Second Expansion by Umar

The second caliph Umar demolished all the houses around the mosque except that of Muhammad's wives to expand it. The new mosque's dimensions became 57.49 m × 66.14 m (188.6 ft × 217.0 ft). Sun-dried mud bricks were used to construct the walls of the enclosure. Besides strewing pebbles on

the floor, the roof's height was increased to 5.6 m (18 ft). Umar moreover constructed three more gates for entrance. He also added the *Al-Butayha* for people to recite poetry.

Third Expansion by Uthman

The third caliph Uthman demolished the mosque in 649. Ten months were spent in building the new rectangular shaped mosque whose face was turned towards the Kaaba in Mecca. The new mosque measured 81.40 m × 62.58 m (267.1 ft × 205.3 ft). The number of gates as well as their names remained the same. The enclosure walls were made of stones laid in mortar. The palm trunk columns were replaced by stone columns which were joined by iron clamps. Teakwood was used in reconstructing the ceiling filza.

Al-Masjid an-Nabawi during the Ottoman Era**, 19th century**

In 707, the Umayyad caliph al-Walid ibn Abd al-Malik (r. 705–715) renovated the mosque. It took three years for the work to be completed. Raw materials were procured from the Byzantine Empire. The area of the mosque was increased from 5,094 square metres (54,830 sq ft) of Uthman's time to 8,672 square metres (93,340 sq ft). A wall was built to segregate the mosque and the houses of the wives of Prophet Muhammad. The mosque was reconstructed in a trapezoid shape with a length of 101.76 metres (333.9 ft). For the first time, porticoes were built in the mosque connecting the northern part of the structure to the sanctuary. For the first time, minarets were built in Medina as he constructed four minarets around it.

Abbasid caliph al-Mahdi (r. 775–785) extended the mosque to the north by 50 metres (160 ft). His name was also inscribed on the walls of the mosque. He also planned to remove six steps to the *minbar*, but abandoned this idea, owing to this causing damage of the woods on which they were built. According to an inscription of Ibn Qutaybah, the caliph al-Ma'mun (r. 813–833) did "unspecified work" on the mosque. Al-Mutawakkil (r. 847–861) lined the enclosure of Prophet Muhammad's tomb with marble. The Mamluk sultan al-Ashraf Qansuh al-Ghawri (r. 1501–1516) built a dome of stone over his grave in 1476.

The Green Dome**, in** Richard Francis Burton**'s *Pilgrimage*, ca. 1850 CE**

Mahmud II's successor, Abdul Majid I (r. 1839–1861), took thirteen years to rebuild the mosque, beginning in 1849. Red stone bricks were used as the main material in reconstruction of the mosque. The floor area of the mosque was increased by 1,293 square metres (13,920 sq ft). On the walls, verses from the Quran were inscribed in Islamic calligraphy. In the northern side of the mosque, a *madrasah* was built for "teaching Quranic lessons".

Saudi Era: View of Masjid-e-Nabawi Gate 21, 22 as seen from the north, the gate with two minarets is *Bāb Al-Malik Fahd* (Arabic**:** بَاب الْمَلِك فَهْد, lit. **'Gate of the** King Fahd'**)**

When Saud bin Abdul-Aziz took Medina in 1805, his followers, the Wahhabis, demolished nearly every tomb dome in Medina in order to prevent their veneration, and the Green Dome is said to have narrowly escaped the same fate. They considered the veneration of tombs and places thought to possess supernatural powers as an offence against *tawhid*. Prophet Muhammad's tomb was stripped of its gold and jewel ornaments, but the dome was preserved either because of an unsuccessful attempt to demolish its hardened structure, or because some time ago Ibn Abd al-Wahhab wrote that he did not wish to see the dome destroyed despite his aversion to people praying at the tomb. Similar events took place in 1925 when the Saudi ikhwans retook—and this time managed to keep—the city.

After the foundation of the Kingdom of Saudi Arabia in 1932, the mosque underwent several major modifications. In 1951 King Ibn Saud (1932–1953) ordered demolitions around the mosque to make way for new wings to the east and west of the prayer hall, which consisted of concrete columns with pointed arches. Older columns were reinforced with concrete and braced with copper rings at the top. The Suleymaniyya and Majidiyya minarets were replaced by two minarets in Mamluk revival style. Two additional minarets were erected to the northeast and northwest of the mosque. A library was built along the western wall to house historic Qurans and other religious texts.

In 1974, King Faisal added 40,440 square metres to the mosque. The area of the mosque was also expanded during the reign of King Fahd in 1985. Bulldozers were used to demolish buildings around the mosque.[32] In 1992, when it was completed, the area of the mosque became 1.7 million square feet. Escalators and 27 courtyards were among the additions to the mosque.

A $6 billion project for increasing the area of the mosque was announced in September 2012. After completion, it could accommodate between 1.6 million[34] to 2 million worshippers. In March of the following year, *Saudi Gazette* reported that demolition work had been mostly complete, including the demolition of ten hotels on the eastern side, in addition to houses and other utilities.

Architecture

The mosque, masjid in Arabic, is the Muslim gathering place for prayer. Masjid simply means “place of prostration.” Though most of the five daily prayers prescribed in Islam can take place anywhere, all men are required to gather together at the mosque for the Friday noon prayer.

Mosques are also used throughout the week for prayer, study, or simply as a place for rest and reflection. The main mosque of a city, used for the Friday communal prayer, is called a jami masjid, literally meaning "Friday mosque," but it is also sometimes called a congregational mosque in English. The style, layout, and decoration of a mosque can tell us a lot about Islam in general, but also about the period and region in which the mosque was constructed.

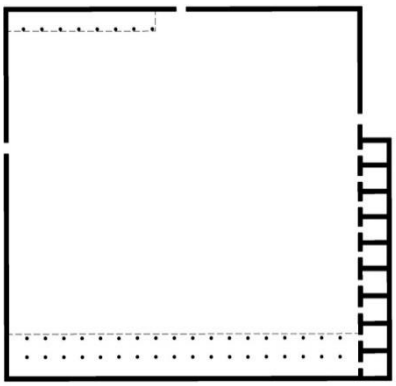


Diagram reconstruction of the Prophet's House, Medina, Saudi Arabia

The home of the Prophet Muhammad is considered the first mosque. His house, in Medina in modern-day Saudi Arabia, was a typical 7th-century Arabian style house, with a large courtyard surrounded by long rooms supported by columns. This style of mosque came to be known as a hypostyle mosque, meaning "many columns." Most mosques built in Arab lands utilized this style for centuries.

Common features

The architecture of a mosque is shaped most strongly by the regional traditions of the time and place where it was built. As a result, style, layout, and decoration can vary greatly. Nevertheless, because of the common function of the mosque as a place of congregational prayer, certain architectural features appear in mosques all over the world.

Sahn (courtyard)

The most fundamental necessity of congregational mosque architecture is that it be able to hold the entire male population of a city or town (women are welcome to attend Friday prayers, but not required to do so). To that end congregational mosques must have a large prayer hall. In many mosques this is adjoined to an open courtyard, called a sahn. Within the courtyard one often finds a

fountain, its waters both a welcome respite in hot lands, and important for the ablutions (ritual cleansing) done before prayer.

Another essential element of a mosque's architecture is a mihrab—a niche in the wall that indicates the direction of Mecca, towards which all Muslims pray. Mecca is the city in which the Prophet Muhammad was born, and the home of the most important Islamic site, the Kaaba. The direction of Mecca is called the qibla, and so the wall in which the mihrab is set is called the qibla wall. No matter where a mosque is, its mihrab indicates the direction of Mecca (or as near that direction as science and geography were able to place it). Therefore, a mihrab in India will be to the west, while a one in Egypt will be to the east. A mihrab is usually a relatively shallow niche, as in the example from Egypt, above. In the example from Spain, shown left, the mihrab's niche takes the form of a small room, this is more rare.

Minaret (tower)

One of the most visible aspects of mosque architecture is the minaret, a tower adjacent or attached to a mosque, from which the call to prayer is announced.

Qubba (dome)

Most mosques also feature one or more domes, called qubba in Arabic. While not a ritual requirement like the mihrab, a dome does possess significance within the mosque—as a symbolic representation of the vault of heaven. The interior decoration of a dome often emphasizes this symbolism, using intricate geometric, stellate, or vegetal motifs to create breathtaking patterns meant to awe and inspire. Some mosque types incorporate multiple domes into their architecture, while others only feature one. In mosques with only a single dome, it is invariably found surmounting the qibla wall, the holiest section of the mosque. Because it is the directional focus of prayer, the qibla wall, with its mihrab and minbar, is often the most ornately decorated area of a mosque.

Furnishings

There are other decorative elements common to most mosques. For instance, a large calligraphic frieze or a cartouche with a prominent inscription often appears above the mihrab. In most cases the calligraphic inscriptions are quotations from the Qur'an, and often include the date of the building's dedication and the name of the patron. Light is an essential feature for mosques, since the first and last

daily prayers occur before the sun rises and after the sun sets. Before electricity, mosques were illuminated with oil lamps. Hundreds of such lamps hung inside a mosque would create a glittering spectacle, with soft light emanating from each, highlighting the calligraphy and other decorations on the lamps' surfaces. Although not a permanent part of a mosque building, lamps, along with other furnishings like carpets, formed a significant—though ephemeral—aspect of mosque architecture.

The two tiered mosque has a rectangular plan. The Ottoman prayer hall lies towards the south. It has a flat paved roof topped with 27 sliding domes on square bases. Holes pierced into the base of each dome illuminate the interior. The roof is also used for prayer during peak times, when the domes slide out on metal tracks to shade areas of the roof, creating light wells for the prayer hall. At these times, the courtyard of the Ottoman mosque is also shaded with umbrellas affixed to freestanding columns. The roof is accessed by stairs and escalators. The paved area around the mosque is also used for prayer, equipped with umbrella tents. Sliding domes and retractable umbrella-like canopies were designed by the German architect Mahmoud Bodo Rasch, his firm SL Rasch GmbH, and Buro Happold. (See later)

The Rawdah Today or the Garden

The boundaries of the Rawdah today are marked according to the first opinion i.e. the Rawdah is the area between the tomb of the Prophet of his pulpit inside Masjid Nabawi. The Rawdah is rectangular in shape and measures 26.5 metres in length from east to west, although part of it lies in the Sacred Chamber so the accessible area is 22 metres long. From north to south, it measures 15 metres. The total area of the Rawdah is approximately 397.5 square metres.This area was adorned significantly during the Ottoman era in an effort to sanctify and highlight its significance. Today, the colour of the carpet defining the area of the Rawdah is light green and has a floral design, in contrast to the rest of the masjid, which has red carpeting. Part of the Rawdah also lies inside the Sacred Chamber of the Prophet beyond the gold grill and is inaccessible to the public. There are also six pillars within the Rawdah which hold special significance.There are two entrances to the Rawdah which are normally guarded by police officers. The area is only able to hold several hundred at once.The Rawdah area is also accessible to women at certain points in the day.

Dimensions

The Rawdah is rectangular in shape and measures 26.5 metres in length from east to west, although part of it lies in the Sacred Chamber so the accessible area is 22 metres long. From north to south, it measures 15 metres. The total area of the Rawdah is approximately 397.5 square metres. As previously mentioned, there are six sacred pillars inside the Rawdah area. There are also another two pillars inside the Sacred Chamber which are inaccessible to the public. The six in the Rawdah are marked by large green circles with gold inscriptions. These are:

1. Perfumed Pillar (Ustuwanah al-Mukhallaqah; **اسطوانة المخلقة**) / Weeping Pillar (Ustuwanah al-Hannana; **اسطوانة الحنانة**)
2. Pillar of the Bed (Ustuwanah al-Sarir; **اسطوانة السرير**)
3. Pillar of the Guard (Ustuwanah al-Haras; **اسطوانة الحرس**) / Pillar of Ali ibn Abi Talib (Ustuwanah Ali ibn Ali Talib; **اسطوانة طالب أبي بن علي**)
4. Pillar of Delegations (Ustuwanah al-Wufud; **اسطوانة الوفود**)
5. Pillar of Repentance (Ustuwanah al-Tawbah; **اسطوانة التوبة**) / Pillar of Abu Lubabah (Ustuwana Abu Lubabah; **اسطوانة ابو لبابة**)
6. Pillar of Aisha (Ustuwanat Aisha; **اسطوانة عائشة السيدة**) / Pillar of Casting Lots (Ustuwanah al-Qur'ah; **اسطوانة القُرعة**) / Pillar of the Emigrants (Ustuwanah al-Muhajireen; **اسطوانة المهاجرين**). Each of these pillars has special importance, explained above.

Boundaries of the Rawdah

Scholars have disagreed about the boundaries of the Rawdah. There are several hadiths that define the During the life of Prophet his houses were situated from the south eastern corner of Masjid Nabawi, where visitors now stand facing the Muwajaha to greet him and his companions, up to the north eastern corner of the mosque. Therefore, they extended along the entire eastern wall of the mosque.From the north eastern corner, they further extended along the northern wall up to the north western corner. The Rawdah would then extend from the pulpit, positioned about midway along the Southern (Qibla) wall of the mosque, up to his houses, which were spread along the eastern and northern walls, until the old Bab al-Rahmah (Door of Mercy).Furthermore, some scholars opine that

the narration which reads “Between my house and my pulpit is one of the gardens of Paradise”, the word “house” should be interpreted to mean all of the houses of the Prophet, rather than only Aisha’s house, which later came to contain his grave.

Conclusion

In the many Hadith’s not quoted here- the Prophet describes the garden of Paradise, which extends throughout all of the areas. But is the Rawdah “Gardens of Paradise”? Should the hadiths regarding this sacred area be taken literally or metaphorically? Some scholars are of the opinion that the Rawdah is like the Gardens of Paradise, in that the peace and tranquillity one feels when worshipping in the Rawdah resembles the peace and tranquillity of Paradise. Others have said that this area is a gateway to the gardens of Paradise and the Pool of al-Kawthar for those perform good deeds in the Rawdah. In other words,worshippers are urged to perform righteous acts within the Rawdah so they will be able to drink from al-Kawthar and attain Paradise on the Day of Judgement. Other scholars have interpreted the Rawdah as being parallel to a garden above it in Paradise. According to other scholars, this very tract of land was bought to the earth from Paradise and will be returned to Paradise after the Day of Judgement.

Green Dome

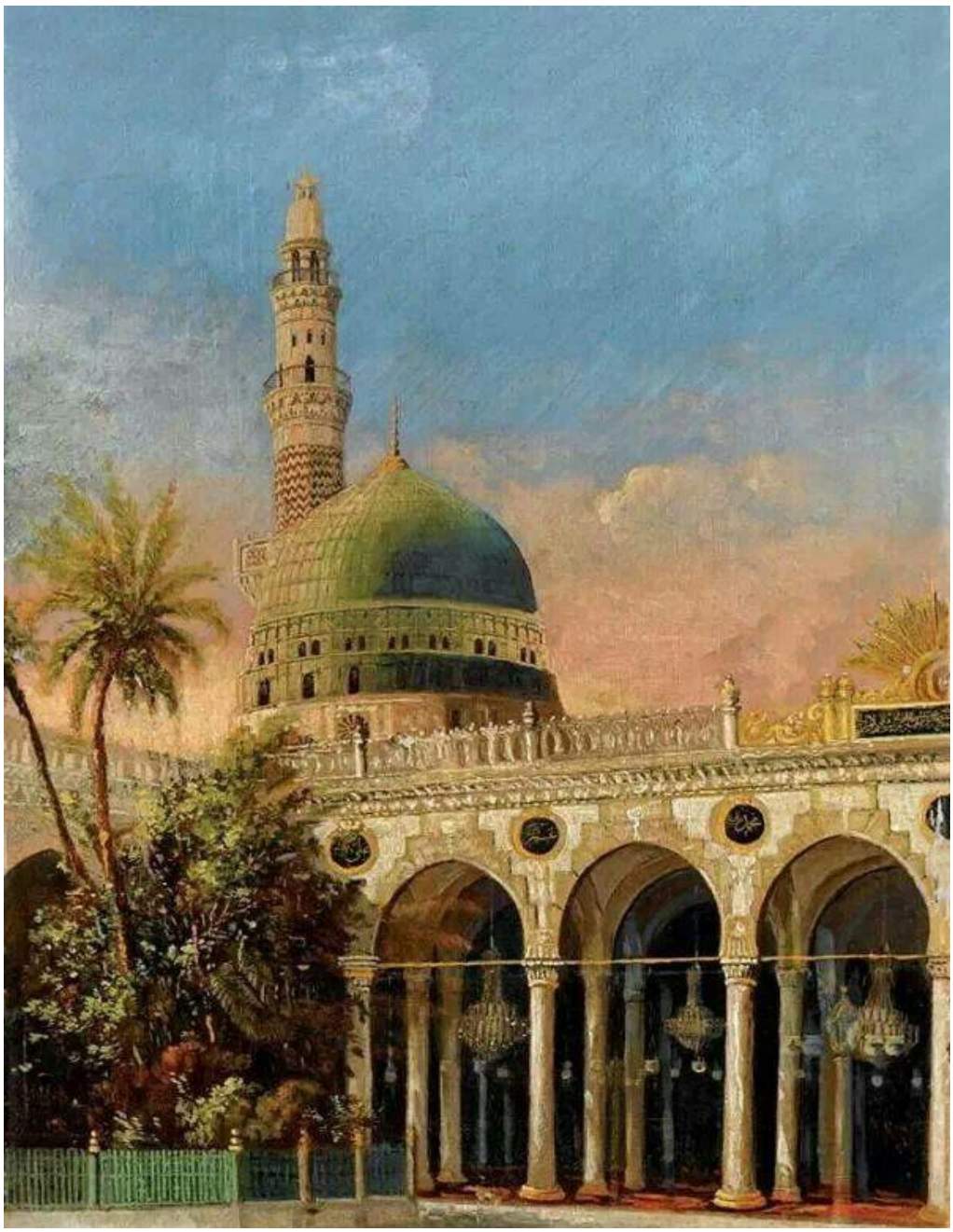
It was constructed in 1817 CE during the reign of the Ottoman sultan Mahmud II and painted green in 1837 CE.The chamber adjacent to the *Rawdah* holds the tombs of Prophet Muhammad and two of his companions, father-in-laws and caliphs, Abu Bakr and Umar ibn al-Khattab. A fourth grave is reserved for ‘Īsā or Jesus, as it is believed that he will return and will be buried at the site. The site is covered by the Green Dome. The dome is located in the south-east corner of the mosque. The structure dates back to 1279 CE, when an unpainted wooden cupola was built over the tomb. It was later rebuilt and painted using different colours twice in the late 15th century and once in 1817.

Built in 1279 CE or 678 AH during the reign of Mamluk Sultan Al Mansur Qalawun, the original structure was made out of wood and was colourless, painted white and blue in later restorations. After a serious fire struck the Mosque in 1481, the mosque and dome had been burnt and a restoration project was initiated by Sultan Qaitbay who had most of the wooden base replaced by a brick structure in order to prevent the collapse of the dome in the future, and used plates of lead to cover the

new wooden dome. The building, including the Tomb of the Prophet, was extensively renewed through Qaitbay's patronage. The current dome was added in 1818 by the Ottoman Sultan Mahmud II. The dome was first painted green in 1837.

Tomb of The Prophet

The Prophet’s grave lies within the confines of what used to be his and his wife Aisha's house, the Hujra. During his lifetime it adjoined the mosque. The mosque was expanded during the reign of Caliph al-Walid I to include his tomb. Muhammad's grave is an important reason for the particular high sanctity of the mosque, as the Dome of the Prophet marks the location of the tomb. Millions visit it every year, since it is a tradition to visit the mosque after the pilgrimage to Mecca.The first two Caliphs, Abu Bakr and Umar are buried next to Muhammad. Umar was given a spot next to Muhammad by Aisha, which had originally been intended for her. Muhammad's grave itself cannot be seen as the area is cordoned off by a gold mesh and black curtain.



Mihrab is a semicircular niche in the wall of a mosque that indicates the *qibla*; that is, the direction of the Kaaba in Mecca and hence the direction that Muslims should face when praying. The wall in which a *mihrab* appears is thus the "*qibla* wall". *Mihrab* should not be confused with the *minbar*, which is the raised platform from which an Imam (leader of prayer) addresses the congregation. The mihrab is located to the left of the minbar. The word *mihrab* originally had a non-religious meaning and simply denoted a special room in a house; a throne room in a palace, for example. The Fath al-Bari, on the authority of others, suggests the *mihrab* is "the most honorable location of kings" and "the master of locations, the front and the most honorable." The *Mosques in Islam*, in addition to Arabic sources, cites Theodor Nöldeke and others as having considered a *mihrab* to have originally signified a throne room. The term was however subsequently used by the prophet to denote his own private prayer room. The room additionally provided access to the adjacent mosque, and the Prophet would enter the mosque through this room. This original meaning of *mihrab – i.e.* as a special room in the house – continues to be preserved in some forms of Judaism where *mihrab*s are rooms used for private worship. In the Qur'an (xix.11), the word *mihrab* refers to a sanctuary/place of worship.

During the reign of Uthman ibn Affan (*r.* 644–656), the Caliph ordered a sign to be posted on the wall of the mosque at Medina so that pilgrims could easily identify the direction in which to address their prayers (i.e. that of Mecca). The sign was however just a sign on the wall, and the wall itself remained flat. Subsequently, during the reign of Al-Walid ibn Abd al-Malik (Al-Walid I, *r.* 705–715), when the mosque was renovated and the governor of Medina, ordered that a niche be made to designate the *qibla* wall (which identifies the direction of Mecca), and it was in this niche that Uthman's sign was placed.Eventually, the niche came to be universally understood to identify the *qibla* wall, and so came to be adopted as a feature in other mosques. A sign was no longer necessary.The Qur'anic passage (xix.11) that refers to a *mihrab* – "then he [i.e. Zakariya] came forth to his people from the sanctuary/place of worship" – is inscribed on or over some *mihrab*s.

Mihrabs are a relevant part of Islamic culture and mosques. Since they are used to indicate the direction for prayer, they serve as an important focal point in the mosque. They are usually decorated with ornamental detail that can be geometric designs, linear patterns, or calligraphy. This ornamentation also serves a religious purpose. The calligraphy decoration on the mihrabs are usually from the Qur'an and are devotions to God so that God's word reaches the people. Common designs amongst mihrabs are geometric foliage that are close together so that there is no empty space in-between the art.

In Medina, there are two mihrabs in the mosque, one was built by Muhammad and another was built by the third Rashidun caliph Uthman. The one built by the latter was larger than that of Muhammad's and act as the functional mihrab, whereas Muhammad's mihrab is a "commemorative" mihrab. Besides the *mihrab*, the mosque also has other niches which act as indicators for praying. This includes the *miḥrâb Fâṭimah* or *miḥrāb aṫ-Ṫahajjud* , which was built by Muhammad for the *Ṫahajjud* .

Minbar

The original *minbar* (Arabic: مِنْبَر (used by Muhammad was a "wood block of date tree". This was replaced by him with a tamarisk one, which had dimensions of 50 cm × 125 cm (20 in × 49 in). Also in 629, a three staired ladder was added to it. The first two caliphs, Abu Bakr and Umar, did not use the third step "due to respect for the Prophet", but the third caliph Uthman placed a fabric dome over it and the rest of the stairs were covered with ebony. The *minbar* was replaced by Baybars I in 1395,

and later by Shaykh al-Mahmudi in 1417. This was also replaced by a marble one by Qaitbay in the late fifteenth century, which as of August 2013, is still used in the mosque.

Minarets

The first minarets (four in number) of 26 feet (7.9 m) high were constructed by Umar. In 1307, a minaret titled *Bab al-Salam* was added by Muhammad ibn Kalavun which was renovated by Mehmed IV. After the renovation project of 1994, there were ten minarets which were 104 metres (341 ft) high. The minarets' upper, bottom and middle portion are cylindrical, octagonal and square shaped respectively.

The Amazing Medina Haram Piazza

Overview and underside view of the shading umbrellas at Al-Masjid an-Nabawi

To protect worshipers from the heat of the sun during prayer, as well as from the risk of slipping and falling in the event of rain the Medina Haram Piazza - convertible Shading Umbrellas or Al-Masjid An-Nabawi Umbrellas were erected at the piazza of Al-Masjid an-Nabawi in Medina, by the King of -.King Abdullah bin Abdul Aziz, It is said that this was his own idea on seeing the plight of the devotgees at the squares of the mosque. This project was overseen by the Custodian of the Two Holy Mosques. The shade of the umbrella is spread in the four corners, and the area covered by the shade extends to 143,000 square meters. These umbrellas are aimed Similar structures are built at the square of the mosques worldwide. At Al-Masjid An-Nabawi, there are total of 250 umbrellas.

The project of 4.7 billion riyals was completed in August 2010, and initially included the construction of 182 umbrellas aligning the pillars of the mosques at the square, and later 68 umbrellas were added in the eastern square, totaling 250 umbrellas. The Saudi Binladin Group has contracted the project's structural planning with the German architectural company SL Rasch GmbH Special and Lightweight Structures led by Mahmoud Bodo Rasch,. As any normal fabric does not provide full protection from ultraviolet rays of the Sun- PTFE fabric was chosen to meet the exceptional requirements. The fabric is characterized by high resistance to tensile strength, wind strength, and its elasticity, chromatic stability, fire resistance, effective shading and suitable light penetration.Polytetrafluoroethylene (PTFE) is a synthetic fluoropolymer of tetrafluoroethylene. Being hydrophobic, non-wetting, high density and resistant to high temperatures, PTFE is an incredibly versatile material with a wide variety of applications, though it's perhaps best-known for its non-stick properties. This highly durable PTFE white fabric was developed by SEFAR Architecture specifically for the project. The shade is painted in white color due to the intensity of light, and a sandy texture was chosen instead of smooth because strong permeability could dazzle people under the umbrellas. In addition, the underside was decorated with oriental motifs made of blue PTFE stripes.

Chapter 15

THE CONCEPT OF HOUSE INTERIORS IN ISLAM

The Prophet (pbuh) is reported to have said that every single person is a shepherd, a guardian or a care-taker (ra'in) and is thus responsible for his or her herd (ra'iyyah), that is to say, for what he or she has been entrusted with. ***Sahih al-Bukhari***

A B S T R A C T

The house of a Muslim accounts as a dwelling place for righteousness, dynamism and confidence. In short, it functions as a mosque, i.e., the place of worship.
Angels are supposed to patronize it; Satan runs away from it. The house of a believer is a source, or a cause, of his happiness and fortune. It is a symbol of his robust civilizational awareness, strength and achievements. It is a symbol of his graceful role on earth.

What then are the characteristics of an Islamic House? Let us scratch the surface of this Ocean of knowledge about Islamic Interiors

Islamic interior designing is about blending art with function. The concept which has its root in the phenomenal structure of Al-Masjid-Al-Nabawi (the second mosque built in the history of Islam), is also a unique blend of designs and patterns of Roman, Byzantine, Persian, Indian and Chinese-regions which were conquered by the Muslims. This very universal blend of concepts makes Islamic

interiors a much replicated and celebrated form across the globe. To admire Islamic interiors and their concept one needs to know the various elements that make a building truly Islamic.

Islamic architecture encompasses a wide range of both secular and religious styles from the foundation of Islam to the present day. Whilst it does have unique characteristics like its geometric and interlace patterned ornaments, it does draw some influence from Persian, Roman, Byzantine Chinese as Indian architectures as Islam was present from the Near East & North Africa to East Asia. This architectural tradition is predominantly found in two types of places: Muslim-majority countries and lands conquered by Muslims during the Middle Ages. In addition to Arab states—like Algeria, Egypt, and Iraq—Islamic architecture is also prevalent in European regions with Moorish roots, including parts of Spain, Portugal, Italy, and Malta. Though often associated with the Islamic mosque—Muslims' place of worship—this approach to architecture is also apparent in other edifices, from palaces and public buildings to tombs, forts and houses.

Whether religious or secular, however, the splendid style is defined by several common characteristics. Islam as a comprehensive way of life influenced the planning and designing of the houses of its adherents. Not only that, Islam also laid a solid foundation, in some instances in form of laws, for creating what came to be known as the phenomenon of Islamic housing. The Holy Qur'an furnishes Muslims with a comprehensive conceptual framework for housing. The Prophet provided scores of lessons in Islamic housing to his followers while developing the city of Madinah after migrating there from Makkah. This framework has been first applied, explained and further enriched by him as revelations came upon him. Such lessons are to be held by Muslims as both universal and everlasting as he is considered as the last and only Messenger of Allah to mankind. And are a part of the *sunnah* which each and every Muslim is required to follow to whatever extent possible.

Islamic Ummah : The" house" occupies an extraordinary place in Islam. It is a family development centre where individuals and families breed and nurture as units of the Islamic ummah (community). In Islam, the house is a place to rest, relax the body and mind, and enjoy legitimate worldly delights. Within the realm of their houses, Muslims also worship, teach, learn and propagate the message of Islam.

While the mosque is probably the most important venue in Islam, the house is more than just a place to live. It's regarded as an intimate place of worship, and many aspects of the design and decoration of Islamic houses are done with religious precepts in mind. The Islamic design is not merely a style for decoration; it involves respect for a deeply spiritual way of life. Therefore, there's a difference between Islamic interiors and Islamic-inspired decoration. Most Muslims consider their home an important place of worship and design it accordingly. In this lesson, learn about the main features of Islamic house design and explore some of the most important decorative elements that are used. Elaborate ornamentation, Persian rugs, and wooden lattice windows are all elements of Islamic decoration that have prevailed over time, not only because of their beauty but for their cultural and religious significance. They're conceived in a way to show respect for Allah (God) and the values of Islam.

House Design

The Quran provides an outline of how a Muslim home should be. Similarly, the prophets have set the example of many different features that should be respected and included in every home.

Houses should be as ample and comfortable as possible, and effective ventilation and lighting are very important. Incorporating nature is also appreciated, so gardens and fountains have been part of the Islamic tradition for centuries. Gardens are often seen as representations of paradise, with abundant water and vegetation. Unlike Western gardens, they are for contemplation rather than recreation.

The inner courtyard is a common feature in large houses, and it provides natural ventilation, lighting, and also the perfect location for a private intimate garden.

Islamic houses as places of worship

Inside every Muslim house, there's a space for praying. It can be an entire room or just a little corner but is always away from the busy areas and ideally pointed towards Mecca. A place for studying the Quran is also common and is generally close to the praying area. It was for the reason that the house should function as a leading social institution and a dynamic family development centre, the compulsory prayers, all the rewards that men can procure while performing them in mosques, women at home too.

The Hadith literature provides further extensive collection of such statements with Islamic house content. Muslims follow the Hadith with full acceptance as these are the authentic holy sayings and their companions. Even though praying Salah in designated mosque is the norm for contentment in their lives, Muslims do keep a place for prayer in the houses.

Rules to Reach a Modern Islamic Interior Design

1. **Spatial Planning:** Islamic teaching does not provide any direct guiding principle for the placement of the different spaces but focuses on performance of tasks, which inspire spatial planning. Praying five times a day is highly appreciated in Islamic religion and attention to the spatial planning could be influenced by this.

2. **Zones**: The house planning is divided into three major zones according to the privacy requirement including public zone, semi-public zone and private zone.
3. **Banned Figurative objects:** Rule number one is not to include any figurative objects in the design plan. This means no art with human or animal shapes as well as no free-standing statues or animal figures in furniture or accessories. They decorate with abstract art, landscape or Islamic calligraphy art instead.
4. **Colour:** Islamic interior design is popular around the world. A large number of Muslims consider the colour green as an Islamic colour. Also, many Muslims prefer brown over black as their choice for a neutral colour. Black is usually associated with funerals and death whereas brown is warm and inviting navy blue, grey and black home decor are the most popular in the Arabic-Islamic modern style homes.
5. **Delicate Fixture and Texture:** Calligraphy of Quranic verses has had a perennial effect on Islamic design followed by extremely detailed friezes of flowers and geometric patterns.
6. **Geometric Patterns:** Some distinctive features of modern Islamic architecture include geometric patterns and bright colors, most notably in the tiles known as Zelij. Also, ornamental Islamic calligraphy, open courtyards with lush gardens, and U-shaped entries as well as large domes.
7. **Privacy of Homes:** Privacy is of utmost importance in a Muslim home. That is why window shades that allow light to penetrate while providing privacy should be selected. In order to bring a shading decorated with Islamic geometric patterns, we add an Islamic vibe to the

design of the room. A laser cut screen has been used not just as a functional window, but also to enhance the room. Houses usually have separate bedrooms for the parents, one for female children, and one for male children. Inside each one, the bed is commonly oriented so that the person faces the direction of Mecca when sleeping on the right side or, at least, in a way that the head points towards it.

8. **Toilets**: When using the toilet, Muslims shouldn't face Mecca nor turn their back to it, and running water is important for cleansing. This led to the development of large bathhouses in ancient times. In modern days, hand showers are often installed next to the toilet.
9. **Arched doorways:** Arched doorways is the most striking and prominent element of Islamic architecture. The arches (also called the horseshoe arches) can be either round, lobed or pointed, each one adding a spacious feel to the interiors in its own way. These are often ornate with minute embellishments and patterns.
10. **Doors** should be inward so that the location of bed is not visible from the door to provide privacy among family members. Islamic religion strictly enforces segregation of non-mehram male from female members to maintain privacy.
11. S**eparate doors** are provided for private and public zones. This tradition is adopted in almost all the Muslim countries and separate doors are provided in the main entrance lobby for public space i.e. drawing room; semi-private i.e., living room and kitchen public spaces and private spaces i.e., bedrooms as shown in figure
12. **Drawing Rooms:** Drawing room is especially reserved for non-mehram33 guest to serve the purpose of hosting. It is placed at an isolated space within a Muslim house so that the women can perform their tasks within a house.
13. **Washroom design** plays a very important role in Islamic Architectures as certain values are related to its placement. Muslims faces Qibla during prayer, this means that toilet/ WC should not be placed on that direction
14. **Windows**: Islamic traditions do not allow Muslims to violate visual privacy by looking into neighbour houses through windows, small window have been provided
15. **Terraced courtyard** is a distinguished feature in house planning of Pakistan. It is provided in some of the contemporary houses to facilitate the female users of the house to enjoy the outdoor environment without sacrificing their privacy.

16. **Bedroom.** Islamic teaching doesn't give us any guidelines regarding the interior design of bedroom. But there are some social and ethical guidelines that can lead to better design of bedrooms. Islam religion gives guideline for the placement of bed in a Muslim house. It should be facing Qibla i.e. 260.527164 Clockwise.
17. The concept of **Mushrabiya** which is an architectural element characteristic of Arabic residences used since the Middle Ages up to the mid-20th century. It is a type of projecting oriel window enclosed with carved wood latticework located on the second story of a building or higher, often lined with stained glass, commonly used on the street side of the building; however, it may also be used internally on the sahn (courtyard) side. The style may be informally known as a "harem window" in English. In many cases today, this has been replaced with modern drawing room in which male and female guests sits together, but not in Arabic countries where they are provided separately. A typical house in Saudi Arabi is known to have:

    1. First floor is reserved for female family members.
    2. Public area i.e., drawing room is connected with semi-public area.
    3. Public area is kept separated from semi-public and private areas.
    4. Non-hierarchical design of privacy zones. Hierarchical design of privacy zones.
    5. Having guest room in semi-public zone. Having guest room in public zone.
    6. Have dining room in semi-public layer. Have dining room in public layer.
    7. Have one staircase for family and guest. Have two staircases

18. **Worship:** This precept obviously requires that there should be inside the house a space, irrespective of its size and position, which will be earmarked to function as a place for conducting certain worship activities, both individually and collectively. The followers of Islam are encouraged to have designated spaces in their houses. In short, the house of a believer functions as a form of the mosque, as it were, i.e., the place of worship. Angels patronize it; Satan runs away from it. The house of a believer is a source, or a cause, of his happiness and fortune.

Due to the relationships of Islamic countries with the west, Islamic Architecture has been influenced not only by modern technology, new materials and construction methods leading to erosion of some principles in Islamic Architecture.

C H A P T E R 16

'Carpe Noctem' (seize the night)
A journey into Architectural Media

A B S T R A C T

In recent years, rapidly developing technology in lighting, media and building materials has led to the creation of a new type of hybrid architecture – lighting and media appear as a layer that can be woven into a three dimensional space – simply known as media architecture.

In a wide sense, media architecture is any surface in the three dimensional built environment that contains a matrix of lights that are individually controllable.

This approach is fundamentally different to traditional architectural lighting and offers endless new opportunities in designing the built environment. This ethereal lighting layer has great impact on the human experience of space.

This paper explores the huge possibilities with regard to pushing the boundaries in media architecture as society moves towards 'carpe noctem', architecture and design.

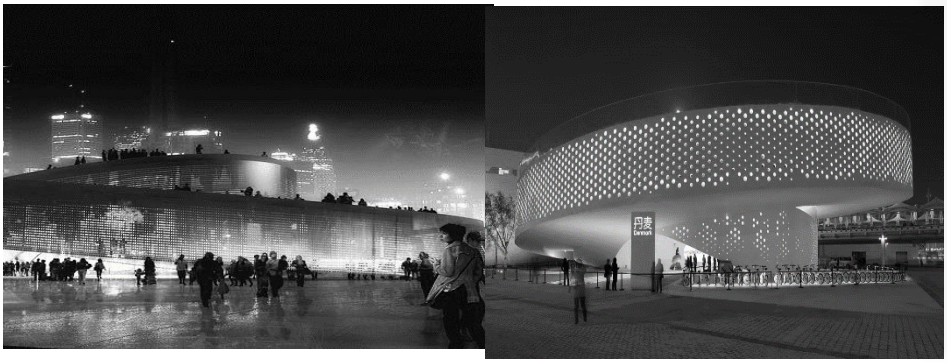
A facade is a foreign loan word from the French *façade,* which means "frontage" or "face". It means generally one exterior side of a building, usually the front. In architecture, the facade of a building is often the most important aspect from a design standpoint, as it sets the tone for the rest of the building. From the engineering perspective of a building, the facade is also of great importance due to its impact on energy efficiency. For historical facades, many local zoning regulations or other laws greatly restrict or even forbid their alterations hence various NEW AGE methods came up for design displays on these. Urban interactions are the ways in which public space is constructed, made available, and governed. Whether through digital or physical means, designing interactions in these hybrid spaces is a research challenge that requires an interdisciplinary approach

In recent years, rapidly developing technology in lighting, media and building materials has led to the creation of a new type of hybrid architecture – lighting and media appear as a layer that can be woven into a three dimensional space – simply known as media architecture. In a wide sense, media architecture is any surface in the three dimensional built environment that contains a matrix of lights that are individually controllable. This approach is fundamentally different to traditional architectural lighting and offers endless new opportunities in designing the built environment. This ethereal lighting layer has great impact on the human experience of space. The possibilities with regard to pushing the boundaries in media architecture are huge and as society moves towards architecture and design need to adapt and offer attractive solutions to its transformation.

With its various facades, the city provides a challenging context for interaction design. The urban landscape here can be used to have a plethora of design interactions- from the embedded sensor, to the interactive media facade, to the mobile networks distributed throughout. Media architecture focuses primarily on the built environment, urban interactions tend to highlight the complex situations in multi-functional spaces. Situations include combined public and private spaces, multiple stakeholder involvement, civic life, and commercial activities whereas urban Interactions explore the design, the design processes, interfaces, and the use of urban space.

In the field of urban computer-based interaction, media architecture is an umbrella term for installations in which displays are integrated into architectural structures. Using media facades as a

subcategory of urban computing it revolves around coming to grips with sense-making and social interaction as parts of identifying key characteristics of interactions with media facades in an urban setting. Apart from that it means attacking specific challenges of designing media architecture by on design research-through-design, conducting real-life design and interventions and various aspects of urban computing. Recent cases includes the very successful Danish Pavilion at the Shanghai Expo 2010.



The Danish Pavilion at the Shanghai Expo 2010

The Danish pavilion at the Shanghai Expo not only exhibited the Danish virtues by use of Architectural Media, but through interaction, the visitors were able to actually experience some of Copenhagen's best attractions – the city bike, the harbor bath, the playground and the picnic. The bike is a popular mean of transportation and a national symbol – common to Denmark and China. In recent years, however, it has had a very different fate in the two countries. While Copenhagen is striving to become the world's leading bike city, heavy motor traffic is on the rise in Shanghai, where the car has become a symbol of wealth.

At the Danish Pavilion the bike was relaunche as a symbol of modern lifestyle and sustainable urban development. The Pavilion and the entire exhibition could be experienced on city bikes that were free for the guests to use. The building was designed as a double spiral with pedestrian and cycle lanes taking visitor from the ground and through curves up to a level of 12 metres and down again. In this way they could experience the Danish exhibition both inside and outside at two speeds – as calm stroll or as a bicycle trip. Both Shanghai and Copenhagen are harbor cities. The polluting activities in the Copenhagen harbors have been replaced by harbor parks and cultural institutions, as the result, the water has become clean enough to swim in. In the heart of the pavilion the guests found the Harbour Pool. Children dappled their feet in the water experiencing a Danish city life where the water in the harbour is clean. In the middle of The Harbour Pool,the actual Little Mermaid from Copenhagen was placed exactly as she usually sits in Copenhagen. And in Copenhagen the place where the Mermaid sat was adorned by Chinese artist Ai Weise sculpture.

The sequence of events at the exhibition took place between two parallel facades – the internal and external. The internal was closed and contained different functions of the pavilion. The external facade, pavilion's façade outwards, was made of perforated steel. In the evening time, the indoor activity of the pavilion was illuminated for passers-by.

The Danish artist Jeppe Hein designed a 'social bench' that ran alongside the bicycle lane. In some places, the bench adapted to its environment elastically and different functions were added such as a bar for food and drink.

There are numerous challenges faced when designing urban media façades. The challenges concern a broad range of issues: interfaces, physical integration, robustness, content, stakeholders, situation, social relations, and emerging use. The challenges reflect the fact that the urban setting as a domain for interaction design is characterized by a number of circumstances and socio-cultural practices that differ from those of other domains. It can be vandalized due to changes in socio-cultural sensitivity of its passers-by; can be misaligned in a distinctive architectural grid due to its installation after the building's completion or can be disconnected due to a drastic change in the societal perception of its carrier building and can display no, or no original, content due to a lack of timely planning.[1]

"Despite the inherent 'dynamic' character of media architecture, that is its theoretical ability to show anything, at any point in time, on any sort of surface, it is still confronted by issues of inadequate and inconsiderate integration when its context tends to change. Moreover, in spite of its claimed social, cultural, economic, architectural and urban qualities, media architecture is still considered as an embellishment, an artifact that can simply be added or switched off, or display no, or inappropriate, content. " IBID

Media Architecture may comprise of the following:

1. Animated architecture: Projects demonstrating creative media facades solutions. Facades of buildings increasingly animated by integrated light sources. Designers focusing more and more on the perception of the building with flexibility of content is rather limited due to resolution, colour and shape of the pixels. In most cases the pixels are highly customized and present a creative challenge to the project.
2. "Money" and entertainment architecture: Projects incorporating buildings that are closely related to business, banks, shopping centres, entertainment and gambling. Lighting on building surfaces might be designed to attract people and encourage spending, or to represent the power of the institution, as in the case of banks for example.

3. Infrastructure and Participatory Architecture: Innovation and the impact on the city are essential characteristics of these projects that support the development of sustainable social structures with urban digital media or media architecture regardless of whether projects are made in an artistic or civic society or any other context. Examples: neighbourhood screens for sharing cars, tools, rooms, etc., and for offering local services like yoga, learning, etc.
4. Hybrid systems that consist of digital and social components.
5. Spatial media art: Projects produced in an artistic context at the intersection of architecture and media art. Mostly non-permanent movable installations with an innovative form of spatial interaction and/or perception of space.
6. Other trends & prototypes include special solutions like three-dimensional displays, kinetic facades, OLEDs or robotic elements that could shed light on what future media architectures might look like.

City Making Wien: Other recent example is: In 2018 CityMaking! Wien was designed as an online toolbox that facilitated the conception, design and submission of parklets in Vienna. With this tool a simple solution was made possible for the participation of citizens in the development of their neighbourhoods. At the moment **CityMaking!Wien** offers four different tools:

1. Basic information about parklets and what should be considered for the conception and construction of a parklet in Vienna, regarding the security, the design and other aspects.
2. A parklet potential map that shows where would be possible to build a parklet, by showing in red the different restrictions that apply for the use of parking places. The map simplifies the understanding of the regulations and offers a new understanding about public spaces. A design tool that facilitates the creation of the required drawings for the submission. The tool is very simple to use, yet it has considered many of the requirements regarding dimensions and security. People can also download the drawings and edit them according to their own visions.
3. An online submission tool that facilitates the contact with the authorities and the submission of the required documents to obtain a permit for the use of parking places.
4. These tools encouraged people to become active and submit their ideas using the online form. The final decision regarding the use of parking places was taken by the city of

Vienna but the toolbox was a great example on how technology could trigger dynamics in cities, by providing new understandings of public spaces.

The field is still evolving, education to students in various workshops organised by international experts are arranged at events such as annual conferences. Parties from the professional field and the business sector will also be involved as partners in biennales.[2] Amsterdam and the Nordic countries seem to be focal points of Media architecture that seems to be spreading far and wide. Other institutes of higher education and universities from outside the region also contribute.

R E F E R E N C E

1. The Role of Context in Media Architecture, Andrew Vander Moer et al: https://www.researchgate.net/publication/254463053
2. MAB 18,Beijing, China, 13-16 Nov. 2018

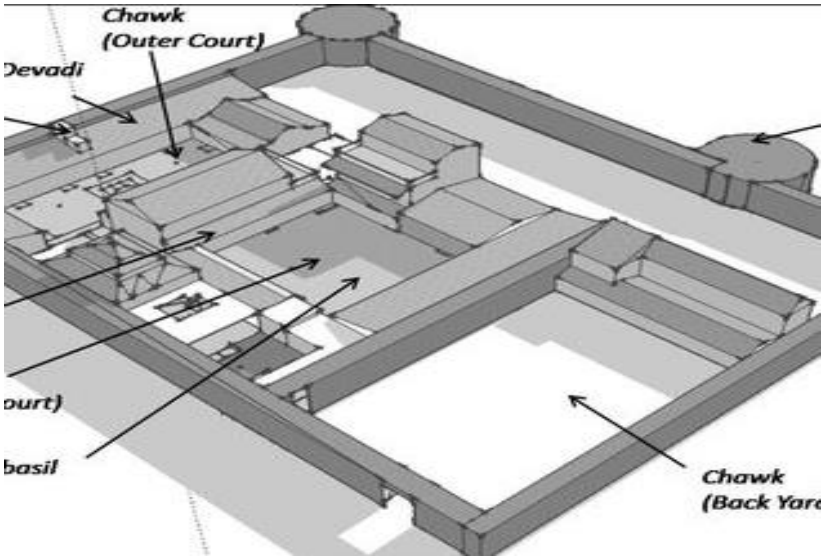
C H A P T E R 17

DOKRAS WADA - वाडा-
COURTYARD HOUSES OF MAHARASHTRA(NAGPUR)

"Be it on the garden side or on the courtyard side of life, we have the potential to rise up against the dictatorship of destiny"
- Erik Pevernagie, *Belgian painter and writer*

A B S T R A C T

When we were young, living in Nagpur we played in some of the resurrected old houses of the traditional royal or court families to which I belonged; other children of such old families were our friends and classmates. The other houses that were old and neglected were ruins in the premises. I was fascinated with these magnificent structures, not lofty but intricate with a central courtyard surrounded by a residential structure and other living rooms. I decided to make a study as part of my architectural repertoire hence this introductive paper ending with pictures and descriptions of the *Dokras Wada* in Chandur(Rly) near Nagpur which belonged to my great-great-great grandfather Ranganath Dokras.



Introduction: A courtyard or court is a circumscribed area, often surrounded by a building or complex that is open to the sky. Such spaces in inns and public buildings were often the primary meeting places for some purposes, leading to the other meanings of court. Both of the words *court* and *yard* derive from the same root, meaning an enclosed space. A courtyard house is a type of house—often a large house—where the main part of the building is disposed around a central courtyard. Many houses that have courtyards are not courtyard houses. For example, large houses often have small courtyards surrounded by service rooms or corridors, but the main rooms are not disposed around a courtyard such as in England are not traditional Courtyard houses.

The main rooms of a courtyard houses often open onto the courtyard, and the exterior walls may be windowless and/or semi-fortified and/or surrounded by a moat. Courtyard houses of this type occupy an intermediate position between a castle or fortress, where defence is the primary design consideration, and more modern plans in which defence is not a consideration at all. In England the courtyard house was a popular design for large houses in the sixteenth century, after noblemen had stopped building themselves castles, but before thoughts of defence were altogether forgotten in the planning of country houses. Courtyards—private open spaces surrounded by walls or buildings—have been in use in residential architecture for almost as long as people have lived in constructed dwellings.

The courtyard house makes its first appearance ca. 6400–6000 BC (calibrated), in the Neolithic Yarmukian site at Sha'ar HaGolan, in the central Jordan Valley, on the northern bank of the Yarmouk River, giving the site a special significance in architectural history. Courtyards have historically been used for many purposes including cooking, sleeping, working, playing, gardening, and animal husbandry.

Before courtyards, open fires were kept burning in a central place within a home, with only a small hole in the ceiling overhead to allow smoke to escape. Over time, these small openings were enlarged and eventually led to the development of the centralized open courtyard we know today. Courtyard homes have been designed and built throughout the world with many variations.

Courtyard homes are more prevalent in temperate climates, as an open central court can be an important aid to cooling house in warm weather. However, courtyard houses have been found in harsher climates as well for centuries. The comforts offered by a courtyard—air, light, privacy, security, and tranquillity—are properties nearly universally desired in human housing.

Wada: Maharashtrian Courtyard Houses: The architecture of Maharashtra where the language Marathi is spoken is known as Maratha Architecture and dates back to the 17th and 18th century with high architectural and cultural significance. It is based on the Hindu tenets of VASTU_SHASTRA. According to which the main Courtyard belongs to Lord Brahma the supreme God of the Hindus. It is the main source of "energy" for the building or structure of the dwelling. A series of rooms were built surrounding it. This was WADA. The Wada was distinctive architectural style of the region proliferating during 1700-1900. During the 16 th & 17 th Century, after the establishment of the power of the Peshwas of Maharashtra several dwellings came into existence at all levels of the society small, medium or palatial. The wadas arose in time of an economic and cultural renaissance. This was preceded by the Maratha Rule with wars between the Marathas and Moghuls, once however, this period ended and the Peshwas took over, stability was restored to the Maratha lands which gave rise to this type of architecture .Material present and available and technique presently used were two factors that impacted the design. The wada was a Cheaper castle or Palace and a combination of administrative offices as well as dwelling. Its design reflected combative mood of the building towards the incessant heat of the region.

Wadas were the residential form of Maratha architecture, said to have evolved under the patronage of the Peshwas. Wada is derived from the Sanskrit word 'Vata' which means plot or piece of land meant for a house3.The traditional residence 'Wada' included houses of several families or only one family who stayed there. It is generally used to denote courtyard house mansion. This House form belonged to ruling classes as well as commoners. This typology is very significant in terms of historical, cultural and economic aspects. Though there are certain variations in size, scale and economical status, but all wadas do share some of the basic elements and characteristics. Wadas were designed according to the caste, occupation and status of the family. The size and location of Wada and its basic planning may have remained similar but the architectural elements and furnishings become more distinct depending on the wealth of the family.

Courtyard houses are distinct traditional house-form in India. Wada as a residential typology was largely built during 1700-1900 A.D. The form was used for construction of houses of different social classes and adapted to diverse lifestyles of its owners. These were introvert with central courtyards, to grant privacy and protection. Traditional Indian families were joint families, with three or more generations staying together sharing the kitchen. Eldest member of the family got the status as head of family. Spaces within the house were categorized as gender-based domains. Rather than individuals, family members were recognized as men, women and children. Within the traditional setup, fulfilling the demands of privacy of an 'individual' was not a priority. Higher the place of individual in the family, more important privacy was and more clearly it was articulated in the interior forms of the house.

Traditional houses of Nagpur region known as the Wadas were developed during the Bhosale period (1746-1853) and followed a typical pattern of house building with courtyards. Urbanization of Nagpur took place in the first half of the 18th century surrounding the fort of Gond Raja. It was during the Bhosale period (1746-1853) that the place acquired an urban character. This period is considered the Golden Age in the history of Nagpur. Bhosale were Maratha rulers of Pune and were deputed to keep an eye on Nizam's movement in the eastern region of the country. Bhosale were on temporary deputation, its architectural character could not achieve the glory of the Maratha architecture as in places of western Maharashtra. Nagpur being the geographic centre of India, its architecture is

influence by Bengal and Rajasthan state and in a later period, by the Colonial style. The concept and design of the Wada was brought here to Nagpur by the Peshwas from Pune who migrated here.

Typical Features of 'Wada'

1. **Chawk:** There are a number of chawks in the Wada, The more the Chawks, the bigger or more affluent the status of the owner. The typical Wada is two storied and overlooks the chowk. The chowk acts as a visual connector and ventilates the interior spaces of the Wada. The Chawk also functions as a transition space between the public and private areas of the house. The Wada and 'Chawk' is a module of traditional house-form where the number of chawks in the Wada, depicted the status of the family.
2. **Kacheri:** The administrative or office part of the building
3. **Diwankhana:** An Urdu term was the living room
4. **Tijory** was the treasury where generally a safe box was kept
5. **Swayampakghar:** Kitchen
6. **Kothar :** Store room
7. **Gotha:** Cow pen
8. **OSARI:** Surrounding the Chawks are the open verandas (osari) which allow multiple activities to take place.
9. **Dandi:** Within the larger plot, the structure is placed abutting the approach road with an imposing entrance door termed as Dandi along with rooms for watchmen called devoid.
10. **Tatabandi:** The house is protected with high compound wall termed as Tatabandi. The entrance veranda is used to receive the strangers. The houses have relatively small front yards and huge backyards. The spaces in the Wada are flexible and are used for multiple activities during day and night-times.
11. **Collective plane**: Wadas in the Nagpur region do not reflect the modern concept of differentiated spaces for various activities wherein each room is connected to another and different activities exist on a collective plane. The sacred spaces are the most important in the house and at times so elaborate that there are Wada encompassing a temple that is accessible by any outsider or stranger.

12. **Cattle shed, the servant rooms and toilets**: The spaces for cattle shed, the servant rooms and toilets are located in the backyard.
13. **Wada Garden**: Every Wada is provided with areas for plantation and space for holy Basil (tulas) as an essential feature of every house. According to the caste, occupation and status of the family, the size and location of Wada is designed, but basic planning principle remains similar. With increase in status and wealth of the family, the architectural elements and furnishing become more distinguished.
14. **Temple**: The sacred spaces are the most important in the house and at times so elaborate that there are Wadas encompassing a temple that is accessible by any outsider or stranger.

Construction Material**:** The wadas were built of Lime, bricks made from Clay that were available in te market called"vita".Cowdung,sand, Wooden beams cut from trees,Gum and Jaggery were mixed with soft soil,cowdung to make the bonding material.

Number of such wadas were built in the Maharashtra area(which was then C.P and berar) many fell to ruin as they were expensive to maintain, some however were preserved and have had a renaissance. Several such wadas were found in and around the larger cities and are still standing.

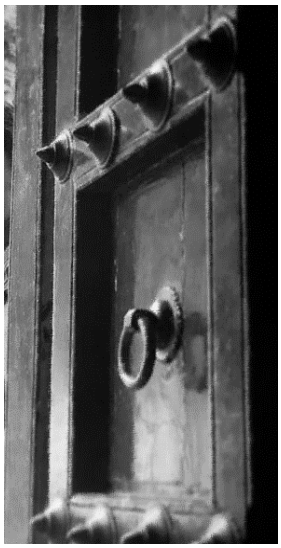
Most are gone- **"**It is not the beauty of a building you should look at; its the construction of the foundation that will stand the test of time."- David Allan Coe

Cooking STOVE woor fuelled

Dokras Wada at Chandur(Railway) near Nagpur:

This wada is 300 year old and belonged to my Great great grandfather Ranganath Dokras who emigrated here from Ahmednagar. He was a wealthy landlord there and went into cotton cultivation for which he migrated to the cotton belt of Maharashtra near Nagour at Chandur and bought 200 acres of land which he utilized for cotton cultivation and owned a ginning Mill also to deseed the cotton. As seen it is a 2 storied structure.

2 types of wooden staircases that were present there. Made of teak wood and held together by cast iron Nails, Gum and tarter



Details of one of the doors. More decorative than for any protection. Also seen are some stone kitchen equipment for grinding and pulverizing grains

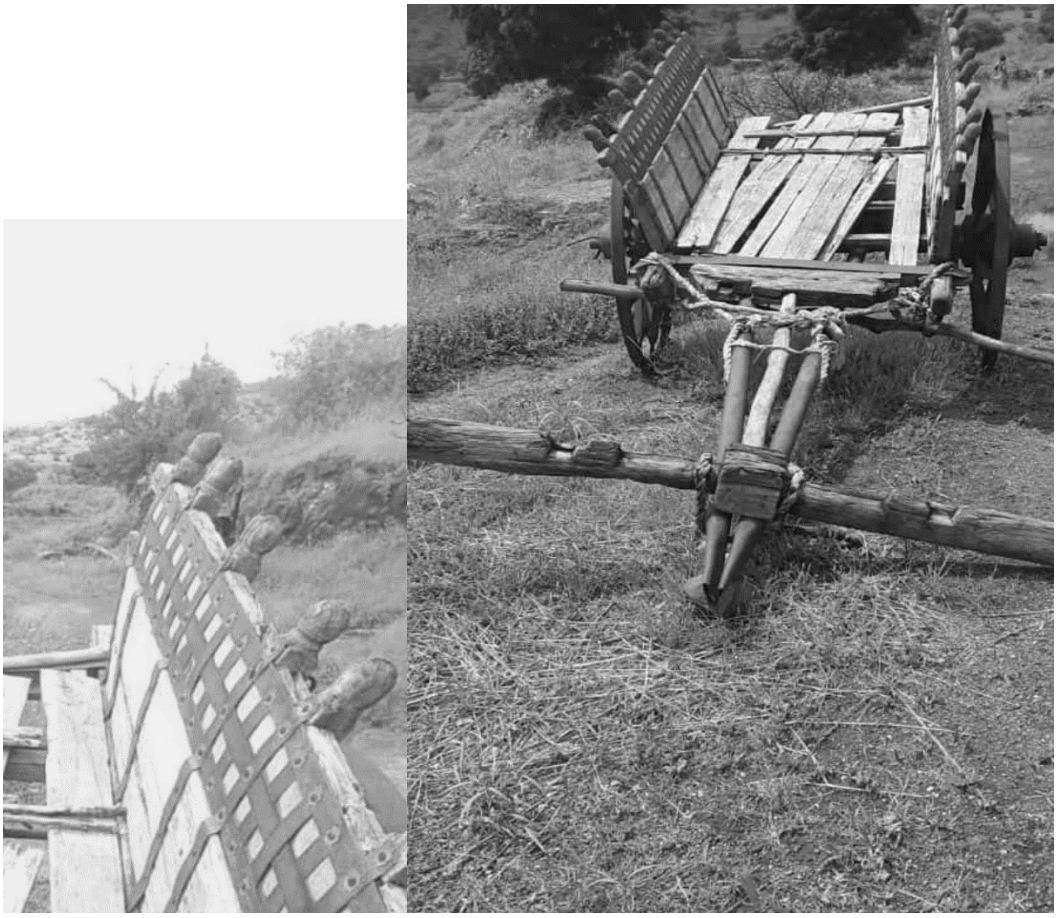
Courtyard seen from entrance.Today parts of the wada have been given on rent to a Bank as well as to the Village councils. The ubiquitous “TULSI” tree in the holy garden in backyard.

Wooden Balcony

passage

Grain Grinding stones

Door



Finer details of a Bull Carriage (Right) like a Horse Carriage but BULL powered

C H A P T E R 18

COMPARISON of the STRUCTURE of HUMAN BODY with the HINDU TEMPLE

Lord Krishna manifesting his complete self to Arjuna as a multi headed multi armed deity.
Sculpture from the Singapore Sri Mariamman Hindu Temple

श्रीभगवानुवाच- इदं शरीरं कौन्तेय क्षेत्रमित्यभिधीयते। एतद्यो वेत्ति तं प्राहुः क्षेत्रज्ञ इति तद्विदः॥
idam sariram kaunteya ksetram ity abhidhiyate etad yo vetti tam prahuh ksetra-jna iti tad-vidah

This body is a temple.
Lord Krishna- In Bhagavad Gita

A B S T R A C T

There is a belief and very little writing on the Hindu temples and their architecture. This belief hold that temples were designed in form of the human body but here in this article I will try to assert that that was not always true. In fact temples were abodes for the God. The God manifested itself as a human form in later years and hence the genealogy transformed that the temple is in form of Human, but it is in form of God not human. Certain liberties were therefore taken not to mention that early temples form the sites of Mohanjo Daro etc have temples as houses. No human forms there.

"Everything is governed by one law. A human being is a micro cosmos, i.e. the laws prevailing in the cosmos also operate in the minutest space of the human being." SWAMI VIVEKANANDA

Architecture and the Human Body

The relationship between architecture and the human body obviously has a long history. The comparison between architecture and the human body crops up first in the works of Vitruvius, *The Ten Books on Architecture* written in the time of Augustus. He writes that in the human body there is a kind of symmetrical harmony between forearm, foot, palm, finger, and other small parts; and so it is with perfect buildings. In the case of temples, symmetry may be calculated from the thickness of a column, from a triglyph, or even from a module; in the ballista, from the whole a ship, from the space between the tholepins and in other things, from various members.[1]

And again writes:

"A building is a body or a "carcass," lettered over "with beauty of diction, with poetic illustration, and with the charms of rhetoric. . . . What the skin is to the body, the hair to the head, the eye-brows and lashes to the eyes, and the lips to the mouth—such is the marble casing to the walls, the cornice to the façade, the pediment and the architrave to the windows, and the porch to the door."

"Beyond the gestalt discourse of form and shape of tectonic buildings, the human body plays an imperative role throughout the whole process of production, exchange, and consumption of everyday architecture. Both the human body and architecture are a form of "material flow" that are made up of many machines for enunciating, which include the prosthetic body of fashion, the moving body of urbanity, and the technologized body of mediatecture. "[2]

A temple (from the Latin 'templum') is a structure usually built for the purpose of, and always dedicated to, religious or spiritual activities including prayer, meditation, sacrifice and worship. The Hindu temple is seen as a link between man and god; and between the actual and the ideal. As such it has got to be symbolic. A temple usually called Devalaya, the abode of God, is also referred to as Prasada meaning a palace with very pleasing aspects. Vimana is another term that denotes temple in general and the Sanctum and its dome, in particular. Thirtha, a place of pilgrimage is it's another name.

As soon as the image worship became a vogue temples must have come into being. Here Hindus conceived God in human form, and as such an anthropomorphic (having human characteristics) form required a habitation, a shelter and this resulted in a structural shrine. In the ancient literatures, a temple was simply called a devaqriha, devSlaya devakula -a home of the God, found in Shastras and the earliest temples, therefore were designed after the models of the residential house, and probably there was no difference between a griha (human dwelling) and mandira, 3 rd and 4 th Century saw increase in devotional worship through imagery and sculptures. Hinduism is today a religion of innumerable gods and goddesses; still throughout the religious history one finds two major cults in the religion those of male gods Shiva and Vishnu. The third cult, the mother or goddess who is essentially the consort of Shiva also holds great importance and most temples are devoted to the worship of these three.

The character of Hindu temples reflected local architecture styles and the material found nearby and skills to which the region. The main forms and styles of the Hindu temple were established during 600-800 AD. It is said that structures of Indian temples began to take a definite form in the latter half of the7 th century-its common elements being:

1. The cell or shrine, the garbhagriha (usually square in plan), housed the image and was approached through a columniated porch or Mandapa.
2. The shrine was roofed with a pyramidal spire or vertically attenuated dome like structure known as sikhara .
3. The temple as a whole was raised on a massive plinth and was often surrounded by subsidiary shrines and by an enclosing wall pierced by one or more gigantic gateway towers or gopurams.
4.

Who were the people responsible for the construction of the temple?

1. Architect - Priest (Sthapaka). It was expected of him that he should be a Brahmana of high born family and well versed in sacred texts and rituals i.e Vedas and Agamas. Observers of a code of conduct according to his varna (caste) and stage of asrama (life), he exerts himself in his tapasvin (work), a profound asthika (believer) in the sacred tradition.
2. The architect-priest prepares the plan of the temple
3. Classes of Silpihs (craftsmen) worked there on the site
4. Sthapati (designing architect),
5. Suiragrahin (surveyor),
6. Taksako (sculptor) and

7.Vardhakin (builder-plasterer-painter).
8.There is a reference to Sutradhara or Suiragrahin. Like a project manager or overall in-charge.

The plan for the temple prepared by the architect is called Vastu-Purusamandala [3]and is in the form of a square. It is a geometrical design and the name is a composite Sanskrit word with three of the most important componentsvof the plan.

1. Mandala means circle,
2. Purusha is universal essence at the core of Hindu tradition,while
3. Vastu means the dwelling structure.

Vastupurushamandala is a yantra. The design lays out a Hindu temple in a symmetrical, self-repeating structure derived from central beliefs, myths, cardinality and mathematical principles.[ibid] In building a temple, the Hindu architect is enjoined to carry out all the instructions laid down in the Vastusastras. As a result, in this vast country from the Cape Camorin in the South to Kasmir in the North, from the 4th century A.D till today, temples are marked by a uniformity of plan. Regional differences do exist, but the essential form remains intact.[4]

Structural elements and symbolism

Yantra (Machine)

A yantra comprises geometric shapes, images, and written mantra. Triangles and hexagrams are common, as are circles and lotuses of 4 to 1,000 petals. Saiva and Shakta yantras often feature the prongs of a trishula.

Mantra

Yantras frequently include mantras written in Sanskrit. Madhu Khanna writes that, "Yantra and mantra are always found in conjunction. Sound is considered as important as form in yantra, if not more important, since form in its essence is sound condensed as matter."

Color

Use of colors in traditional yantra is entirely symbolic, and not merely decorative or artistic. Each color is used to denote ideas and inner states of consciousness. White/Red/Black is one of the most significant color combinations, representing the three qualities or *gunas* of nature (*prakriti*). White represents *sattwa* or purity; red represents *rajas* or the activating quality; black represents *tamas* or the quality of inertia. Specific colors also represent certain aspects of the goddess. Not all texts give the same colors for yantras. Aesthetics and artistry are meaningless in a yantra if they are not based on the symbolism of the colors and geometric shapes.

Bindu

The central point of traditional yantras have a bindu or point, which represents the main deity associated with the yantra. The retinue of the deity is often represented in the geometric parts around the center. The bindu in a yantra may be represented by a dot or small circle, or may remain invisible. It represents the point from which all of creation emanates. Sometimes, as in the case of the Linga Bhairavi yantra, the bindu may be presented in the form of a linga.

Triangle

Most Hindu yantras include triangles. Downward pointing triangles represent feminine aspect of God or Shakti, upward pointing triangles represent masculine aspect such as Shiva.

Hexagram

Hexagrams as shown in yantras are two equilateral triangles intertwined, representing the union of male and female aspects of divinity, or Shiva and Shakti.

Lotus

Mandalas and yantras both frequently include lotus petals, which represent purity and transcendence. Eight-petaled lotuses are common, but lotuses in yantras can include 2, 4, 8, 10, 12, 16, 24, 32, 100, 1000 or more petals.

Circle

Many mandalas have three concentric circles in the center, representing manifestation.

Outer square

Many mandalas have an outer square or nested squares, representing the earth and the four cardinal directions. Often they include sacred doorways on each side of the square.

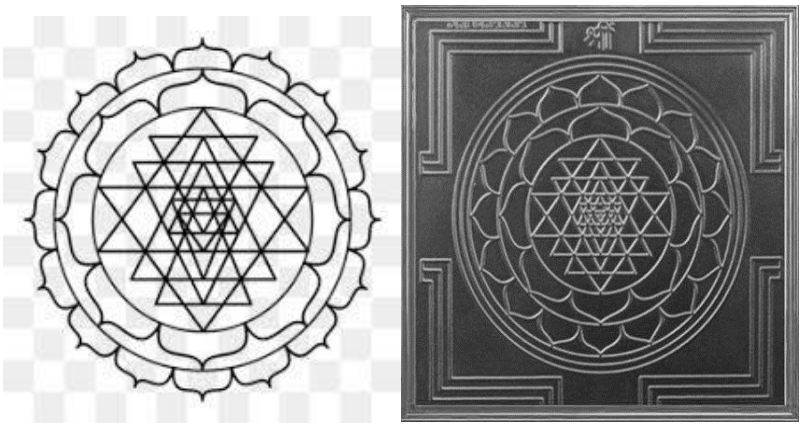
Pentagram

Yantras infrequently use a pentagram. Some yantras of *Guhyakali* have a pentagram, due to the number five being associated with Kali.

Octagon

Octagons are also infrequent in yantras, where they represent the eight directions.

Yantra designs in modern times have deviated from the traditional patterns given in ancient texts and traditions. Designers in India and Nepal may copy design elements from Western imitations of yantras.



There is a belief that Hindu Temples take their cue from the structure of Human body. The vast Hindu canonical literature on Agamic texts, Devalaya Vastu (Temple Vastu astrology) and sacred geography describe the temple as a cosmic man, the 'Purusha' (cosmic man). The legend of the 'Vastu Purusha' states that Vastu Purusha blocked the heaven from the Earth and Lord Brahma along with many other Gods trapped him to the ground. But that is not wholly true.The significance and meaning of each of the structures described above and what rituals we should follow during our temple visit. In Bhagavad Gita, Lord Krishna says that "idam sariram kaunteya ksetram ity abhidhiyate". This body is a temple.The human body is the temple for the indwelling Spirit of God (Antaryamin). Various parts of the temple structure correspond to various parts of the human body. The temple is the physical body (sthoola sarira) which houses the presence of Divine. So the actual building of the temple itself is a symbol of the presence of the Divine in the world.

The Indian temple tradition falls into two broad categories, the Nāgara and the Drāvida, whose separation from the earlier tradition is traced back to the middle centuries of the first millennium. In addition, the texts speak of a hybrid category, called Vesara, which in Sanskrit means “mule” that emphasizes this hybridicty. The mūrti in the garbhagrha stands on its pedestal (pītha). A Vaisnava temple has an image of Visnu, a Śaiva temple has a lingam, and a Devi temple has the image of the Goddess. The garbhagrha is enclosed by a superstructure, and the nature of this superstructure makes the distinction between the Nāgara and the Drāvida type. The Nāgara temple, the mūlaprāsāda, is enclosed by a curved spire (śikhara), while the Drāvida temple has a tiered pyramid form with a crowning top which is called the vimāna. The temple is the embodiment or manifestation of the deity, therefore the names of certain temple parts, as given in Sanskrit, are anthropomorphic: grīva = neck, skandha = shoulder, uru= thigh, jangha = lower leg. The cakras visualised in the practice of yoga are analogous to the stages up the vertical axis of the temple tower in the South Indian temple and it is marked by corresponding levels in the exterior.[5]

The human body as a Temple

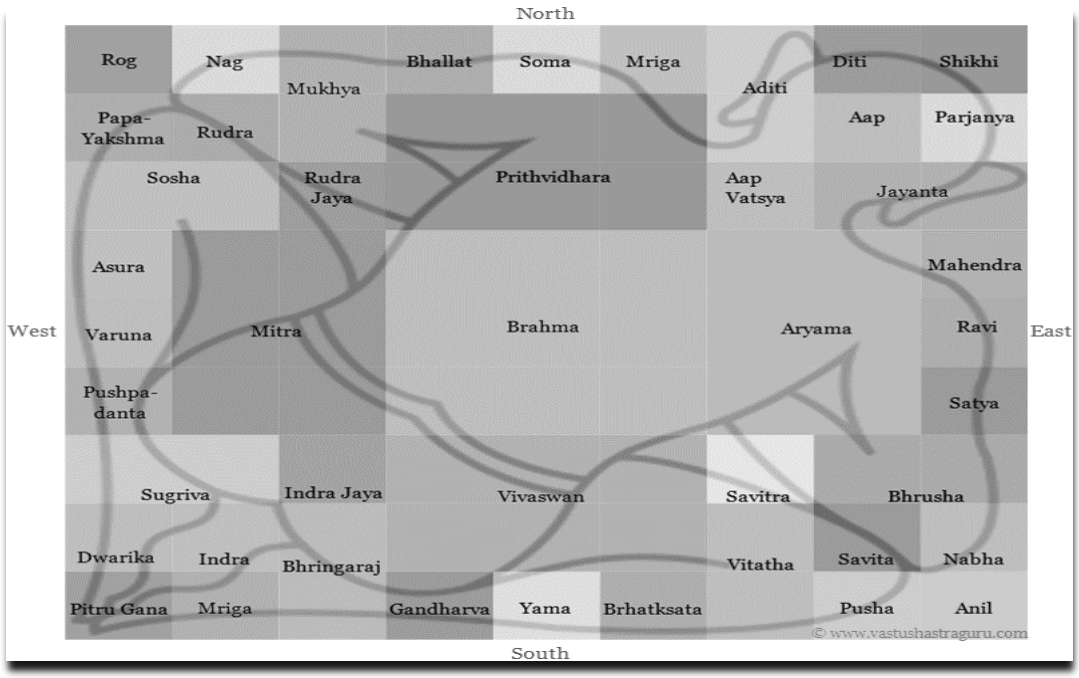
In the Vaishnava tradition devotees wear the urdhva pundra made of gopi chandan commonly known as tilak.

"Tilaka means victory personified." (SPL to Tilaka devi dasi,)

By wearing tilak not only does one identify ones body as the temple of the Lord but also one is blessed by the auspicious protection of the Lord. Not only is the wearer immensely benefited but even those who see the tilak marks are benefited.

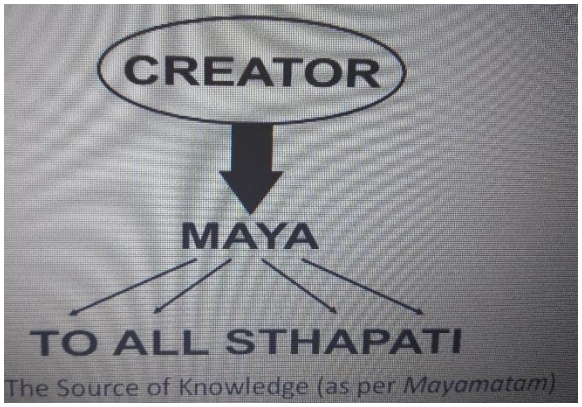
"In Kali-yuga one can hardly acquire gold or jeweled ornaments, but the twelve tilaka marks on the body are sufficient as auspicious decorations to purify the body. " Srila Prabhupada

The whole of the temple starting with the main entrance and the outermost prakaram is the body of the Lord.



The science of Vastu is believed as part of the Indian architecture. *Vastu Shastra* developed during the period of 6000 BC and 3000 BC and the ancient Indian text *Mayamatam* represents Vastu Purusha as the presiding deity for all land structure meant for temples or houses. *Vastu Purusha Mandala* is the metaphysical plan of a temple incorporating course of the heavenly bodies and supernatural forces. This Mandala square is divided into (8×8 =64) 64 metaphysical grids / modules or *pada* for temples. (For dwelling places 9x9=81 metaphysical grids / modules or pada). At this square Vastu Purusha is shown lying with his chest, stomach and face touching on the ground - his head is shown

at *Ishanya* (north-east) and his legs shown at *Nairutya* (south west). The center point is known as *Brahmasthana* and at this vital energy point Lord Brahma presides over the temple site and protects it.



STHAPATI Means Master Builder

Directions in Hindu tradition are called as Disa, or Dik. There are four primary directions and a total of 10 directions: East, South-East (Agneya), West, North-West (Vayavya), North, North-East (Isanya), South, South-West (Nauritya), Zenith (Urdhva), Nadir (Adho).

In the context of products like temples the process was a mix of technical, religious, astrological procedures which were carried out so as to make the product in harmony with the environment and universe. The product was a universe in miniature; complete within itself and in harmony with all sub-systems of the universe. The site become a miniature cosmos; a universe with the client at its center. The site was the upholder of the built form. Various rituals, geometrical matrices (mandalas), astrological deadlines, chanting of verses, etc. are incorporated at appropriate junctures so as to make the site demarcation and the building design and construction flawless. All these were followed in the belief that this building, erected through the labor of the architect, skilled workmen and enlightened client would provide its occupants a fruitful life of material-emotional-spiritual fulfillment.[6]

There are 'Guardians of the Directions' (*Dikpala or Dasa-dikpala*) who rule the specific directions of space.

1. North east Direction ruled by Ishanya Shiva (Load of Water) influences balanced thinking
2. East Direction ruled by Indra (Load of Solar) - influences long life
3. South east Direction ruled by Agneya or Agni (Load of Fire) (Energy Generating) influences

comfort, peace, prosperity and progeny.

4. South Direction ruled by Yama (Lord of Death or Lord of Death / Damage) yields nothing but mourning, depression and pain. If this direction used properly safeguards from envy of others and cast of all evils.

5.West Direction ruled by Varuna (Load of Water / Lord of Rain) (Neptune) influences reputation, fame, prosperity and success.

6. South west Direction ruled by Nairitya - Deity Lord (Demon) Nairitya influences Protection, strength and stability

7. North west Direction ruled by Vayu or Vayavya (Load of Wind) influences peace

8. North (Kuber) - Deity Lord Kuber or Lord of Wealth (Finance) and keeper of riches influences good strength, better business sufficient in flow of money, education, industrial growth etc.

9. Center ruled by Lord Brahma (Creator of Universe)

The '***Aham Brahmasmi***' (*"I am Brahman. I am part of the Universe."*) is the great sayings (Mahavakya) mentioned in Brihadaranyaka Upanishad 1.4.10. of Yajur Veda. The meaning is that 'Whatever is in the Universe, is present in me' (and 'whatever is in me, is part of the Universe'). Indian temples represents the *macrocosm* of the universe and the structure of the human body represents the *microcosm*. Veda also says "*Yatha Pinde tatha Brahmande*". It means what is going on within human being is the same as what is going on in universe. According to the Tamil Saint Tirumular "*our body is a temple*". Here I would like to quote Stella Kramrisch:

"The vastu-purusha-mandala represents the manifest form of the Cosmic Being; upon which the temple is built and in whom the temple rests. The temple is situated in Him, comes from Him, and is a manifestation of Him. The vastu-purusha-mandala is both the body of the Cosmic Being and a bodily device by which those who have the requisite knowledge attain the best results in temple building." [7]

The concept of *chakra* features in *tantric* and *yogic* traditions of Hinduism. In Yoga, *Kundalini Shakti* means the '*coiled power*.' It is compared to a serpent that lies coiled while resting or sleeping. Chakras are vital energy points (*Kundalini energy*) in the human anatomy, i.e. breath channels, or nadis, and the winds (*vayus*), that are centres of life force (*prana*), or vital energy. They include: *1.*

Muladhara, 2. Swadhisthana, 3. Manipura or manipuraka, 4. Anahata, Anahata-puri, or padma-sundara, 5. Vishuddha or Vishuddhi, 6. Ajna and 7. Sahasrara.

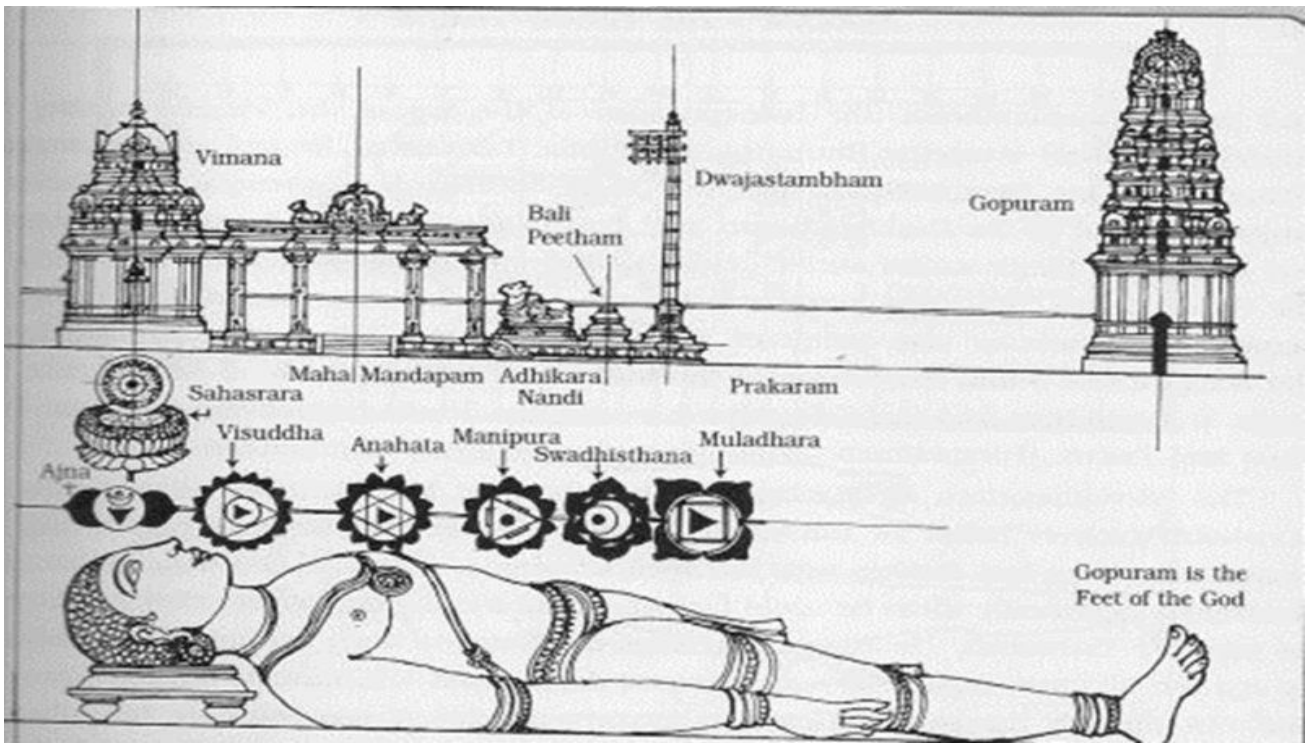
1. **Muladhara** or root chakra located at the base of the spine in the coccygeal region (governs senses). According to Vastu Mandala South-West (Nauritya) -
Deity *Lord* (Demon) *Nauritya* influences protection, strength and stability.

2. **Swadhisthana** or *Adhishthana* at the lower stomach region or the sacrum of the human. Vastu direction West (Varuna) - *Lord Varuna* (Neptune) Lord of Water or Rain. Formation of temple tank or water bodies in South or West will influence reputation, fame, prosperity and success.

3. **Manipura** or *Manipuraka* at the digestive glands (governs digestion through pancreas and adrenal glands) of the human. Digestion involves energy of fire. Female bears navel, womb and umbilical chord. According to Vastu Mandala *Lord Brahma* or Lord of Creation seated on lotus flower base (Adishtana) rules this point. *Cosmic Brahma* bridges the *cosmic human* navel or life. If this point in temple should be left open, the vital energy flows and the wholeness resides with blessings and protection.

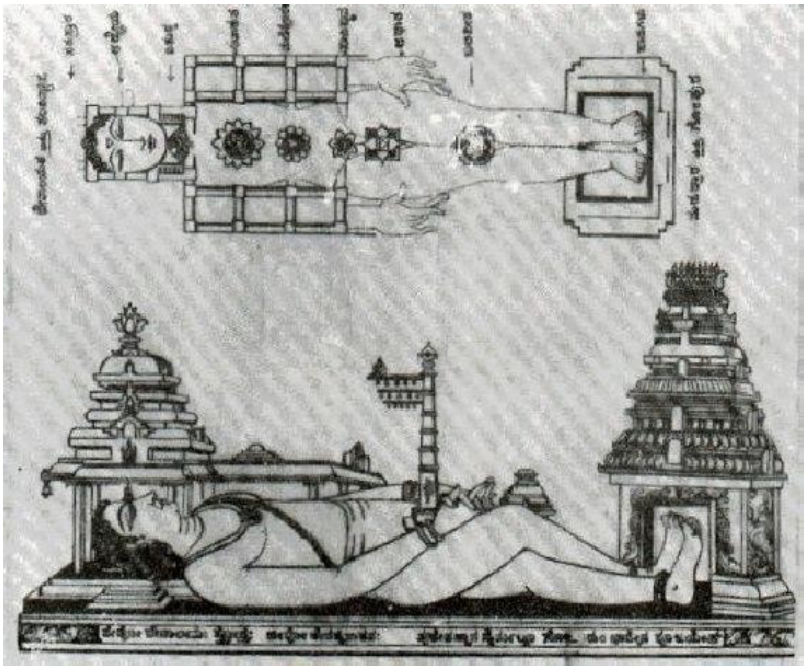
4. **Anahata**, *Anahata-puri*, or *Padma-sundara* located at chest (governs lungs, immune system - thymus of human being). As per Vastu Mandala Lord Vayu or Lord of Wind rules this point. This grid relates to air and regulation of air. If this grid is allowed to flow air and the peace and comfort resides.

5. **Vishuddha** or *Vishuddhi* located at the throat i.e., thyroid glands (governs sound, speech communication and sence of security of human being). Mantras chanted by cosmic human being bridges with cosmic Ishanya. Comic Ishanya is represented in OM, a Pranava Mantra form. According to Vastu Mandala Lord Shiva in Ishanya form rules this grid and represents the space or *Akasha*. Mantras chanted here will reverberate in space. If left free from obstacles and less occupation or weight, there will be balanced power.



6. **Ajna** or third eye located at pineal glands or between the eye brows; the two side nadis '*Ida*' (yoga) and '*Pingala*' are terminating and merge with the central channel '*Sushumna*' (governs higher and lower selves and trusting inner guidance of human being). As per Vastu Mandala this direction is also related to open spaces (‘*Akasha*’) and to the North East corner (Ishanya). The sanctum (Garbagriha or womb chamber) is recommended at this grid, the seat of the divinity.

7. **Sahasrara** or pure consciousness chakra located at the crown of the head - symbolized by a lotus with one thousand multi-coloured petals. According to Vastu Mandala Anja is the sanctum. The *vimanam* and *shikara* forms the space element and the currents of life ascends through the '*Brahma-randra shila'* or stone slab placed at '*griva*' (neck) of the vimana. The finial of the shikara of the vimanam is the grid at which unseen sahasrara located.[6]



Source: Hindu Temple vol 1. by Stella Kramrisch

The picture shown here is reproduced from Hindu Temple vol. 1. By Stella Kramrisch demonstrates that
how the temple structure can be compared with the human body. It is apt to quote the Sanskrit sloka from "Viswakarmyam Vastu Shastra":

"Garba Gruha Sirahapoktam antaraalam Galamthatha
Ardha Mandapam Hridayasthanam Kuchisthanam Mandapomahan
Medhrasthaneshu Dwajasthambam Praakaram Janjuangeecha
Gopuram Paadayosketha Paadasya Angula Pokthaha
Gopuram Sthupasthatha Yevam Devaalayam angamuchyathe"

Meaning: Garba-griham (main sanctum) is equated with human head; antarala (vestibule) is equated with human neck; ardha - mandapam (half-hall) is compared with human chest; maha - mandapam (main hall) is equated with the stomach; flag-post is viewed along with human male organ and gopuram or temple gateway tower is viewed along with human feet.

What is worshipped in a temple is an idea, a conception or the mental image of god, translated to a form in stone or metal or wood; but, it is not the god itself. The structural harmony, the rhythm and a fine sense of proportion is its hallmark. It not merely resolves but also encompasses contradictions. Indian temples represents the macrocosm of the universe and the structure of the human body represents the microcosm. The vastu-purusha-mandala represents the manifest form of the Cosmic Being; upon which the temple is built and in whom the temple rests. The temple is situated in Him,

comes from Him, and is a manifestation of Him. The vastu-purusha-mandala is both the body of the Cosmic Being and a bodily device by which those who have the requisite knowledge attain the best results in temple building.

R E F E R E N C E S

1.Vitruvius, "The Fundamental Principles of Architecture"; on Symmetry: In Temples and in the Human Body," http://www.gutenberg.org/ebooks/20239

2.Beyond Building: ARCHITECTURE THROUGH THE HUMAN BODY Mohd. Shahrudin Abd. Manana, and Chris L. Smith, https://frsb.upm.edu.my/upload/dokumen/FKRSE1_79-227-1-PB.pdf

3. For complete details see my article on The Vastu-Purusha-Mandala in Temple Architecture, Srishti Dokras, https://www.academia.edu/34115475/The_Vastu-Purusha-Mandala_in_Temple_Architecture

4. TEMPLE ARCHITECTURE : AN INTRODUCTION, https://shodhganga.inflibnet.ac.in/bitstream/10603/187259/12/12_chapter%201.pdf

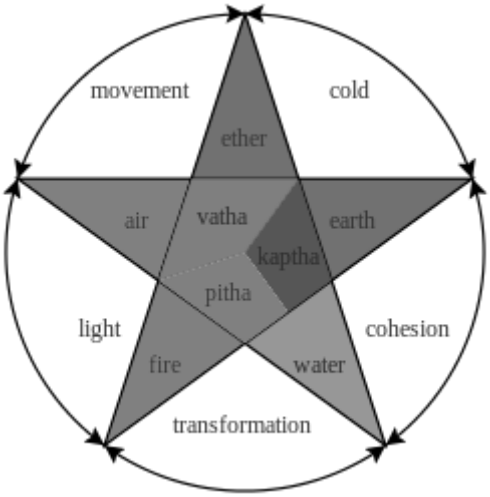
5.Early Indian Architecture and Art, Subhash Kak,Migration & Diffusion - An international journal, Vol.6/Nr.23, 2005, pages 6-27

6. 2000 The Sacred in Indian System of Architecture: A Case example of Mayamatam, Vinay Mohan Das, January 2011, https://www.researchgate.net/publication/295860415

7. The Hindu Temple -Stella Kramrisch Vol. 1&2 Hardcover ,Motilal Banarsidass, Delhi, India, 1976

C H A P T E R 19

. Marketing Ayurveda- Recent Trends



Every Customer is Their Own Market. No longer does one size fit all. Customers expect it their way and are willing to pay for it.
http://webcache.googleusercontent.com/

A B S T R A C T

Ayurveda drugs have been used in different forms right from the ages. It is obvious that their use and benefits have not been marketed all through the period because the development of formulations and its use have been done directly by the physicians. But due to the changes in situations and environment of modern world that the forms and preparations of these medications have become commercialized and that the responsibility is taken up by various pharmaceutical companies. This resulted in large scale production, by different companies which has resulted in rapid commercialization and a competitive arena for the medications. Hence, the new setup has demanded the use of marketing concepts for its proper trade and gain of profits. Thus, it is quite necessary to evaluate the influence of the marketing concepts on the sale of Ayurveda drugs such as product customization. This paper is a telescopic review of marketing trends of the OTC product by Ayurveda Parma companies. This success will shoot up when product meets the quality, safety and efficacy parameter under the regulatory requirements which can create brand picture in the mind of consumers. The objective behind OTC advertisement is to alert the public to their condition and the availability of personal treatments. Since advertising of consumer products is limited by the Amount of information that can be conveyed, its role resides simply in attracting attention and Raising awareness. Apart from that and most importantly, OTC marketing is done to earn REVENUE for the manufacturer.

Ayurveda and Natural Products: Turning a New Leaf
The natural segment in India's personal care market is estimated at
₹18,500 crore
($3 billion), which is
41%
of the total personal care market, says Nielsen

Introduction: Marketing is a social and managerial process by which individuals and groups obtain what they need and want through creating and exchanging products and values with others.[1] It is used to create the customer, to keep the customer and to satisfy the customer. With the customer as the focus of its activities, it can be concluded that marketing management is one of the major components of business management. Because of manufacturing overcapacities companies have shifted their focus from production to the customer in order to sell more and therefore stay profitable.

FMCG Sector in India Indian: FMCG Sector is fourth largest sector of Indian economy. It accounts for roughly 5% of the overall employment in the India by employing around 3 million people. This sector has become very rewarding due to various factor such as low operating cost connected distribution network, reduced penetration levels, large population, rising incomes, upswing in capital inflow from abroad. This has resulted in the the industry becoming very competitive as the number of players have increased tremendously.The Indian FMCG sector growth been phenomenal (approximately 16%). The industry has tripled in size over the last 10 years, growing much faster than in past decades. The FMCG market is also having a bright future in India as per studies and is expected to jump US$ 11.6 billion in 2003 to US$ 33.4 billion in 2015. As per a study conducted by Booz & Company, FMCG sector is expected to grow in the range of 12% to 17% up to 2020 and could touch a market size between Rs. 4,000 to Rs. 6,200 by 2020.[2]

Marketing Strategy is a process of choosing target market, create a strong positioning with differentiated product features and functions which ultimately enable to create a robust and sustainable value proposition to customers. Simply it is the marketing logic through which business organizations achieve its merely objective, increase revenue and market share. Sales and achieve sustainable competitive advantage. Focus on marketing activities creates a strategic advantage for any company and we focus on the Ayurveda company in terms of product strategy product, pricing, Place and Promotions in this paper. To be successful in Indian FMCG Market the firm must concentrate on product customization in the matured product categories like skin care processed and packaged food, mouth wash etc. Currently, the FMCG sector is divided into food and beverages, health care and household along with personal care categories. Food processing (packaged foods, tea, sauces, cooking paste), health drink industry (soft drinks, fruit juices, mineral water) are coming under food and beverages segment. The leading market is covered by Ayurvedic FMCG industry stands with tea (hot beverage market). The tea market is dominated by players such as Twinings, Tetley, GAIA etc. Although Ayurvedic companies like Himalaya, Patanjali and Dabur, Sri SriTatva are trying to penetrate the green tea and food sections. OTC drugs are sold directly to consumers without any medical supervision. The main share of OTC drugs is dominated by leading Ayurvedic industries such as Dabur, Emami, Himalaya, Baidyanath, Patanjali etc,

The household products comprises of surface cleaning agents, disinfectants, insecticides, dish cleaners, toilet cleaners and mosquito repellent. The household sector has seen some upward movement in the last 5 years. A great share of this market is taken up by homemade type operators that visit door to door and sell household products such as Phenyl, and Acid (maximum share) to households. This household care division is characterized by strong competition and high level of dissemination. With rapid urbanization, the presence of the small pack size and sachet, essential for home care products is thriving. In the washing powder area, Ayurvedic companies like Patanjali, Sri Sri Tatva, Lever Ayush is a high market share leader.

Personal care areas include cosmetics, body wash, hair care, oral hygiene products, etc. The hair care market can be divided into hair oil, shampoo, gels, colourful and conditioners. In addition to personal washing can be organized in three areas viz. premium, economy and popular. The skin care market is at a primary stage in India. With lifestyle changes, new product options and availability, people are

becoming more attracted to personal beauty. The oral care markets are segmented into toothpaste, toothpowder and toothbrushes dominated by Dabur, Patanjali, Himalaya, Lever Ayush etc. with a high market share.

The Indian pharmaceuticals market is the 3rd largest in volume terms and and 13th largest in terms of value. It accounts for 20% in the volume terms and 1.4% in value terms of the global pharmaceutical industry as per a report by Equity Master. [3] Of the ethical, classical, over-the-counter, personal care and beauty products, the Ayurveda current FMCG market is $4 billion, or roughly Rs 30,000 crore. To add to the bullish outlook, the Indian Ayurveda industry is projected to record a CAGR of 16 per cent until 2025 - 75 % of it comprising of Ayurveda products and 25% by services (Including medical, well-being or medical tourism). Though estimates vary about the growth of the Ayurveda industry into the future, two different estimates put the industry size at being 13 billion by 2025. Needless to say, Ayurveda, the system of Indian Medicine originally has roots in almost every Indian household, in the form of 'Home Remedies'. Yet households turn to allopathy to cure aliments. Earlier, the supply of raw materials for the manufacture of medicines was surplus and the quantity of manufacturing was considerably less. As the medications was prepared by the physician himself there had been no compromise on quality. But the scarcity of raw materials at the individual's level along with the rise in demand has necessitated a specialized setup that can use the available resources in a much better manner so as to counter and supply the need effectively. This has led to commercialization of the preparations leading to the birth and rapid rise of the Ayurvedic Drug Industry.

Competitiveness in the newly emerging bulk Ayurveda haslead to R&D bringing about a sea change in the quality and effectiveness of the preparations so as to cater to the ever changing needs of the consumer or the patient. This paved way for the inclusion of marketing concepts into the industry so as to obtain maximum results. These concepts include marketing mix of the Product, Price, Promotion and Place. A well-articulated marketing strategy enables to focus on marketing activities which create strategic advantage for the company.

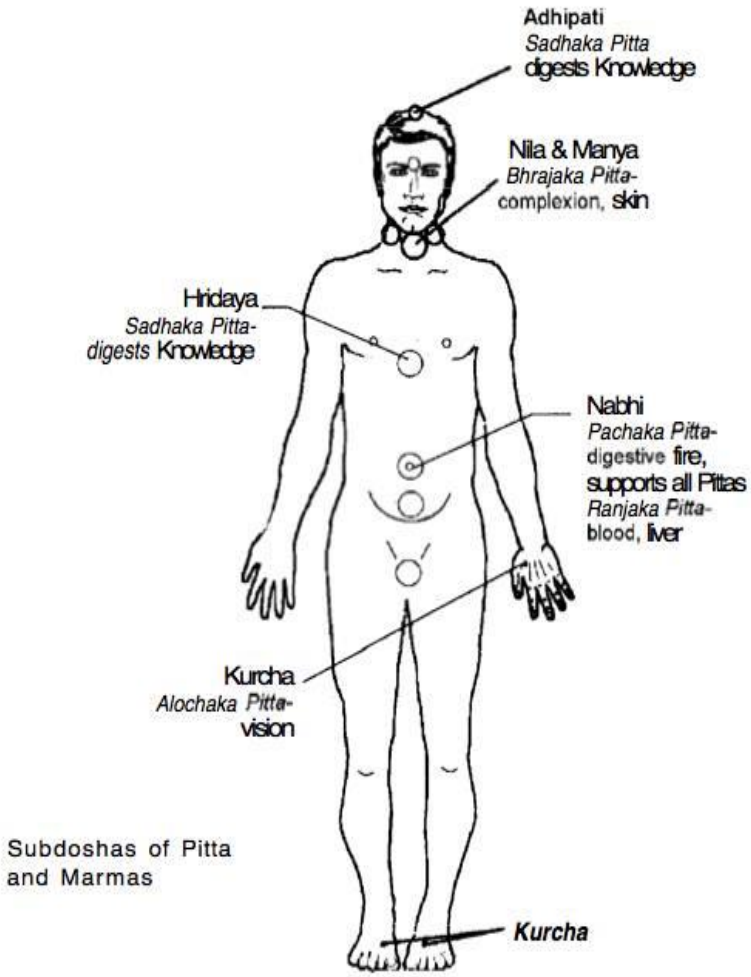
Strategy:

As per the joint market research of Confederation of Indian Industry (CII) and PricewaterhouseCoopers (PwC), [4] the Indian Ayurveda market is all set to register 16 per cent growth

(CAGR) till 2025. And, this correction is mainly accredited to two things, i.e. marketing media tactics and failure of allopathic pathologies in delivering results. Indian household spend on ayurvedic preparations as gone a sea change upwards and significant portion of its monthly budget is spent on toothpaste and pain relievers immunity boosters like Shilajit, Ashwagandha and almond oil. Therefore, the future of Ayurveda is looking fabulous as more and more players are entering the market with innovative products, quality packaging, and strategic marketing activities. Earlier, Ayurvedic companies failed to impress customers with presentation and promotional activities, but the new generation of entrepreneurs is smartly working on these aspects to partake in growing market competition. Moreover, as the travel and tourism industry of India is growing exponentially and foreign travellers are showing tremendous interest in Indian Ayurvedic treatments further tangentially popularizing Ayurveda.

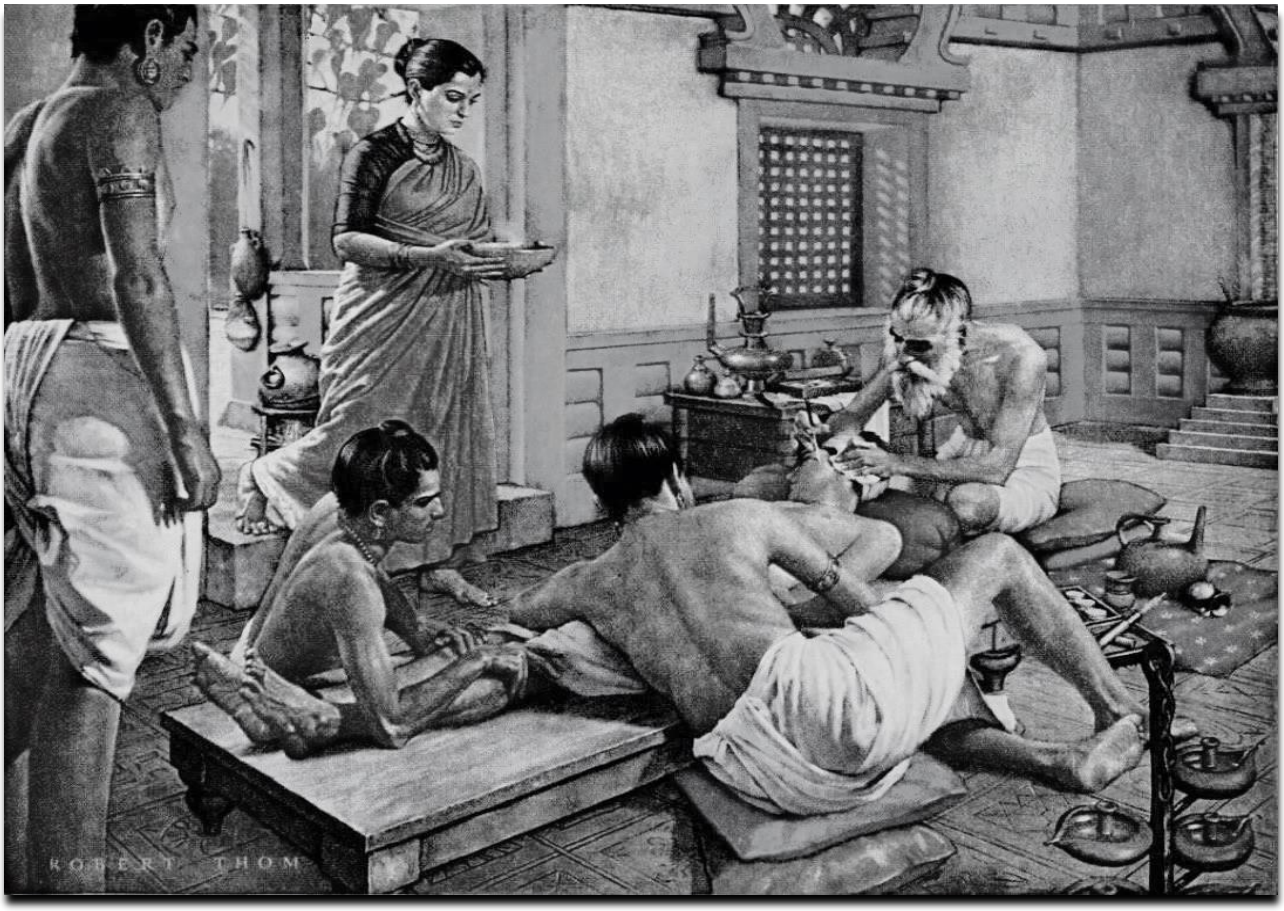
Introduction to Ayurvedic Drugs – The word drug is derived from the French word 'drogue' which means a 'dry herb' . A drug is defined as 'Any substance used for the purpose of diagnosis, prevention, relief or cure of disease in man or animals'. According to WHO 'A drug is any substance or product that is used or intended to be used to modify or explore physiological systems or pathological states for the benefit of the recipient'.[5]

There are various sources of drugs namely- Minerals, Animal, Plant, Microorganisms, Synthetic, Genetic engineering and Hybridoma techniques. The system of Ayurveda also similarly embraces within its folds drugs of plant, animal and mineral origin, both single drugs and compounded drug formulations. Out of the total number of 15,000 plant species in India, about 2000 are known to have medicinal properties and since centuries some of them are used as even home remedies in the rural and remotest parts of the country. Although, Ayurveda does not rule out any substance from being used as a potential source of medicine, presently about 1000 single drugs and 8000 compound formulations of recognised merit are in vogue.



Of all the main classical works on Ayurveda,the 3 great authors are-Charaka,Sushruta,Vagbhata while the minor authors are Sharngadhara,Bhavamishra,Madhava.[6] Ayurvedic texts deal with drugs, their composition and action in addition to the other aspects of the medical system. These texts not only mention the compound formulations but also single drug formulations. Writers and

communicators of these texts were mainly Ayurvedic practitioners of



their time or belonging to their genealogy. As a result there was successful identification, preparation and proper utilization of the drugs either in their single or compound form.

In ancient times, ayurvedic practitioners or VAIDS were of two types. Those that were in the service of the King and those that lived with common folks and alleviated their sufferings by use of formulations and lifestyle change recommendations. When a folk VAID became famous, the Kind and courtiers asked for his services and many times made him a part of the Court of the Kings. Thus the texts and practical knowledge of Ayurveda was preached and practiced for centuries. Housewives also asked the VAIDs and on their recommendations treated her kith and kin. Unlike allopathy, Auyrveda is not a pill popping science but deals with a holistic view of the body and recommends changes in diet and lifestyle to reach a cure. But during the recent period of modernization of India, the changes that have resulted in the social and economic conditions have led to the growth of

urbanization and rapid deforestation. As a result, the Ayurvedic physicians took to cities and lost their contact with the forests and drug sources. Thus, the Ayurvedic practitioner could no longer process and prepare his own medicines as in the past, but had to depend on others to cater his need. It is due to this developed conditions and newer socio – economic set up that resulted in the rise of Ayurvedic Drug Manufacturing Industry. This gave birth to crude drug supplying agencies and commercial manufacture of Ayurvedic medicines. This gave rise to a new segment of market which needed the supply of prepared Ayurvedic medicines and in the same way a new set of industry which dealt with the drug manufacturing sector for Ayurveda.

OTC MARKET : It is the motivational mechanism that the buyer has developed in his mind towards various sets of products that counts at large when turning the head of the consumer towards a product. Buyer behaviour assessment in qualitative terms brings about knowledge of OTC marketing strategy. This includes keeping a watch on the sources of information from where the buyer gets the knowledge about the brands, their frequency of purchase and the decision-making process of the customer and his satisfaction with the formulation. A study of the buyer from all these dimensions is of paramount importance for it would make open the marketing implications and ramifications for the marketers. A deliberate consumer behaviour study helps the marketers to come out with right positioning strategies. It is to say that any effort to assess the market must include a keen and close analysis of what the buyer is in the market. Like in any other product, consumer behaviour involves the psychological process that consumer go through in recognizing his needs, finding ways to solve these needs, making purchase decisions (e.g., whether or not to purchase a product and, if so, which brand and where), interpret information, make plans, and implement these plans.

OTC ayurveda category: This sector is divided into food and beverages, health care and household along with personal care categories and Ayurvedic FMCG industry is based on the expansion and marketing of products consisting of food drinks, health, domestic and personal care etc. The customer preference for over-the-counter drugs, processed food, soft drinks etc has led to reforms of the Fast-moving consumer goods (FMCG) industry which is growing at 4% per year,- more than the global gross domestic product (GDP). FMCG is also the fourth major sector of the Indian financial system. With the increasing speed of the Ayurvedic pharmaceutical market, FMCG players like Patanjali,

Dabur, Emami etc. are interested in expanding to tap the market by their portfolios. In the current scenario, more than 30,000 proprietary and 1500 classical products are available in the market. The market of Ayurvedic FMCG products was estimated to register a compound annual growth rate (CAGR) of 16% between 2016 and 2021 and will increase from current $ 500 million to $ 1.1 billion by 2021.

The products of Ayurvedic medicine are the ones that were not marketed earlier unlike the other commercial products because they were under the category of medicines. Moreover, commercial production of Ayurvedic medicines are only seen in the recent decades when the demand is increased and the physician is not able to fulfill it by preparing it himself. With the changing situation of lifestyles, where every individual finds less or no time to prepare the basic modes of administration, everyone asks for the supply of readily available and immediate usable medicinal preparations. This gave rise to the new field namely the Ayurvedic Drug Industry comprising of around 7000 companies preparing about 1000 single drug and 8000 compound drug formulations. With the advent of the Industry, there was intense competition which resulted in the constitution of Research and Development wing. This wing dealt with the preparation of new and effective formulation which addresses the various expectations of the consumers. Such medicines were patented by the company and gave rise to a new class of medicines namely the patented medicines. These patented medicines have to be marketed efficiently for the purpose of selling it and gaining profits. But the classical medicines have been known from the texts and the physicians who prescribe also know its uses completely. Hence, marketing of such medicines is quite easier compared to patent medicines. Being the birthplace of Ayurveda, the Indian marketplace for Ayurvedic products is more established compared to other parts of the world, particularly the U.S. Additionally the category called “dietary supplements” was not present in India before but now it is rapidly increasing its domain.. The Indian Food Drug and Cosmetic Act has grandfathered Ayurveda and as such products are regulated as drugs. Any product based on the classical Ayurvedic formulary can be sold in the Indian market without any prior approval. Being classified as a drug, health and disease claims are permitted. While there are many products sold “over the counter,” a majority of the products are required to place the statement that the product must be used under the supervision of an Ayurvedic physician. The other difference between India and the U.S. is that there is widespread acceptance of Ayurveda as a treatment option in India. There are more than 700 Ayurvedic hospitals with more than 35,000 beds

and 435,000 Ayurvedic physicians All of this makes treatments and product prescriptions more readily accessible compared to the U.S. But it is also true that not all Indian consumers are knowledgeable about or accepting of Ayurveda. As a matter of fact, mainstream Indian consumers, much like their U.S. counterparts, prefer conventional allopathic medicines. Sales of the Indian pharmaceutical industry far outpace sales of the Ayurvedic industry. Yet this trend is changing. Ayurvedic herbal medicines in India also cost less than drugs. The retail value of the Ayurvedic products market in India is estimated to be around $1.2 billion (2005 figures) and is expected to reach $2.6 billion by 2012.

As the Ayurvedic drug industry deals mainly with those of herbal, mineral, animal or their combination drugs, the quality of the raw material and in turn the quality of the products play a very important role in marketing when compared to the other three elements of marketing mix. No doubt, Indian system of medicine has already received much attention in academic fields. The popularity of Ayurveda is mainly due to its therapeutic efficiency against most chronic diseases where modern medicines are ineffective.[The Western medicine, on the other hand, introduced in Asian countries in early 16^{th} century, when travelers from Western countries began to settle and found themselves in greater contact with native people. This medicinal system got high popularity within a very short period due to its fast action over traditional medicinal systems.

Interestingly, there are certain examples of Ayurveda and Western medicine work well when used in combination. For example, rheumatoid arthritis, a chronic and immune-mediated disease that causes pain and inflammation are not well treatable in modern Western medicine. Present, methotrexate achieves a response in 40–60% patients which cannot say satisfactory at all. Furthermore, methotrexate is associated with distressing and potentially serious side effects. As a result, 68–94% of arthritis patients use complementary and alternative medicine therapy including Ayurveda. Therefore, Ayurveda and Western medicine should be considered as two sides of a coin, and they must come together to work for humankind.

Improvement in personalized medicine with modern technology

The concept of Ayurveda treatment is broad, which endeavours to heal the human being as a whole whereas Western system of medicine has traditionally operated from only a cure model

SYMPTOMATIC also. Now, the time has come to create a new model of the medicinal system by combining both healing and cure models. The value of health care could be increased tremendously through personalized medicine that could be helpful to predict disease risk, prevent progress of disease, and manage treatments more efficiently. Moreover, the developments in the area of pharmacogenetics and pharmacogenomics can help the practitioner to achieve the target of personalized medicine.A personalized medicine does not mean just the right drug for the right individual but the right drug for the specific disease affecting a specific individual.This concept will surely make clinical trials more efficient by reducing the cost usually raises due to side effects, and prescription of drugs those are not effective in certain genotypes.

The concept of personalized medicine is very old and used as long as people have been practicing medicine. In recent time, the personalized medicine is all about DNA while single nucleotide polymorphism and epigenetic factors influence drug response and form the basis of personalized medicine. Hence, the personalized medicine must be improved with the help of modern scientific techniques to promote Indian system of medicine.

That apart, this industry was and still is largely irregular. Growing Indian population, mainly the middle class and the rural sectors, are embracing natural products and this trend will only garner further momentum. In addition, companies of all sizes are racing to keep pace. This manuscript reviews a snapshot of current trends in the Ayurvedic FMCG market and will provide development opportunities and strategies adopted by the multi-billion dollar market.

A key finding of the Ayurveda study by CII [1] is that India's ageing population and the rise of a young population that is health conscious, will drive further the growth of the sector. The size of the Indian ayurveda industry at Rs 30,000 crore per annum compares well with the overall market size of the wellness industry which is put at Rs 85,000 crore. What is significant is that the domestic sector is poised to grow at high double-digit levels in the coming years, and that it continues to be the most important player in the global Ayurveda market. Increased emphasis on lifestyle and wellness, driven by a rise in non-communicable and chronic diseases, is driving the demand for Ayurveda in India. 77 percent Indian households use Ayurvedic products according to another report by PwC. [2] According to them the size of the global Ayurvedic market is expected to almost treble from $3.4 billion in 2015 to $9.7 billion by 2022. More and more people today are looking after their health turning to Ayurveda and other alternative medicine systems and treatments, such as unani, siddha, naturopathy,

and homoeopathy. The Centre has shown a keen interest to promote traditional systems of medicine in recent years. It established the Union Ministry of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy (AYUSH) in 2014. The Modi government has been keen to promote AYUSH both at home and abroad, constructing state-of-the-art homoeopathic laboratories and showcasing the industry at international conferences. This is fuelling growing uptake of AYUSH. However, the Indian System of Medicine as a whole gets only 2% of the total health budget of the nation, while 98% goes to the western type modern medicine.

Marketing trends:

Internet: Marketing to consumers via theInternet has many advantages for marketers. It allows products and services to be offered 24 hours a day, 7 days a week, 365 days a year; it allows products and services to be offered globally in an efficient manner; it is cost efficient in that it saves the need for stores, paper catalogs, and sales people; it provides a means for developingone-on-one relationships with consumers and establishing consumer databases for conducting onlineresearch. Online Business-to-Consumer marketing re-quires marketers to understand consumers and deliver the products and services consumers want and need, just as traditional marketing does. In 2018, marketers proved their ability to serve consumers online, and Internet sales to consumers continue to grow faster than any other form of retailing. Although the e-commerce shakeout in the early 2000s led many analysts to declare that the Internet was off limits, the opposite is true today. For every $1 spent on Google Ads, businesses make an average of $2 in revenue. Social media and watching video content are the two most popular online activities.[3]

Endorsement: Here we discuss how top FMCG firms in India have had to respond to the 'new age' marketing by spiritual figureheads and their promotion of Ayurveda. These endorsements have contributed to this resurgent interest in for Ayurveda-based products, catapulting new brands like the Baba Ramdev-promoted Patanjali to the top.[4] Previously, Ayurveda-based products in the Indian market were restricted to hair oils, the local dietary supplement called Chyawanprash, and over-the-counter palliatives. Now, natural Ayurvedic ingredients are increasingly being integrated into a growing number of products, ranging from shampoos, skincare creams, oils, and powders, toothpaste gels, and soaps to cough syrups, teas, packaged juices, and nutritional supplements, among other

fastmoving consumer goods. These products find appeal among India's millennials in urban and rural markets as well as the already familiar older consumers.

India's natural products segment comprised of 41 percent of the personal care products market in 2017, contributing to US$2.5 billion worth of revenue; tier 2 and 3 cities grew the fastest at nine percent followed by eight percent growth in value in major metro cities. South India and the states of Maharashtra, Madhya Pradesh, and Punjab lead national growth in the natural products segment; industry watchers estimate that future growth will be led by Delhi, West Bengal, and Uttar Pradesh.

Distribution: The largest distribution channel are chemist shops, which led to 19.4 percent value growth for the segment in FY 2016-17. By 2022, India expects the market for Ayurvedic products to rise threefold to US$8 billion. In terms of their FMCG market share in India, Hindustan Unilever Limited (HUL), is the top player followed by ITC Limited and Patanjali Ayurved Limited. HUL recently launched natural versions for shampoo brands Tresemme and Clinic Plus and for fairness face cream Fair & Lovely, as well as the naturals brand Lever Ayush. Patanjali, Sri Sri Tattva bring new retail strategies to FMCG market.

NEW PLAYERS: The wider application of Ayurvedic practices began more than a decade ago with the emergence of a new player in the FMCG market – Patanjali Ayurved Limited. Founded in 2006 by Baba Ramdev, a self-styled yoga guru, Patanjali is an Indian FMCG company focused primarily on the personal care, cosmetics, and packaged foods segments. Patanjali's fortunes have jumped in the last six years; revenues rapidly grew from US$65 million in 2012 to over US$727 million in 2016 to US$1.57 billion in 2017. The company is looking at global expansion in the next five to 10 years**.**

SWADESHI AYURVEDA :

A. Patanjali: Advertised as natural and organic, Patanjali products are also branded as 'swadeshi' or national, owing to their being Made-in-India. The company has also leveraged the mass popularity of its founder, Baba Ramdev, as a yoga teacher and spiritual god man – to effectively be its brand ambassador. Patanjali says it has never carried any external market research, and advertising and operational costs comprised barely 6 and 2.5 percent of the company's total revenue, respectively, in 2016. These costs are far lower than the average spending of most of its

consumer goods rivals. Patanjali's brand of toothpaste, soap, hair oil, and shampoo – all branded Ayurvedic – are among its most popular products. Non-Ayurvedic products like honey and ghee (clarified butter) are also very popular, by association.

1. **FRANCHISE:** Patanjali does not directly own retail stores; instead, Patanjali products are sold in stores owned by independent entrepreneurs or small business groups. Its retail chain also does not include wholesalers. Currently, there are over 10,000 Patanjali stores across India. A representative of a potential Patanjali franchisee undergoes training in Ayurveda. They also provide free medical advice, based on Ayurvedic teachings, to customers.

2. Services provided by Ayurvedic practitioners at Patanjali stores act as a substitute for expensive ad campaigns, with the emphasis being on personalized networking. Further, due to its growing popularity local grocers and department stores to stock up on its goods.

3. Patanjali has now tied up e-commerce retailers Amazon, BigBasket, Flipkart, Grofers, and Paytm Mall to sell its products online.

B. Sri Sri Tattva: Unlike the mass appeal of Patanjali, products by Sri Sri Tattva cater to a niche market of urban middle-class consumers. The company aims to open 1,000 franchise stores by the end of 2018 to garner Rs 5 billion (US$73.53 million) revenue. This is a brand launched by another 'Guru"- Sri Sri Ravi Shankar, capitalizing on the success of Patanjali's Ayurveda branding in 2017.

Sri Sri Tattva will have three types of stores – Sri Sri Tattva Mart (retailing packaged food, personal, and home care products); Sri Sri Tattva Wellness Place (access to healthcare practitioners and health and wellness services); and Sri Sri Tattva Home and Health (retailing daily use products, Ayurveda medicines and access to Ayurveda doctors).

C. Others: These two Guru brands faces stiff competition from established domestic rivals like Dabur, Godrej Consumer, Emami, Hamdard, ITC, Dr Vaidya's, and the Himalaya Drug

Company. Its main foreign competitors are Colgate-Palmolive and Hindustan Unilever Limited (HUL). With the rapid rise of Patanjali, Dabur too has been forced to do a U-turn, to rebuild its image as India's first Ayurvedic company. Dabur is also expanding its total area of land under cultivation from 2,000 acres to 4,500 acres to become India's largest cultivator of rare medicinal herbs. To counter Patanjali's sales model, Dabur has eliminated outsourcing its rural sales to third party vendors by hiring rural sales representatives directly on its payroll. HUL, on the other hand, has responded by increasing its footprint in the natural products market through the purchase of Indulekha, an Indian brand of Ayurvedic personal care products, for US$48 million in 2015. Colgate-Palmolive, the leader in the Indian oral care segment, recently introduced several products containing herbal ingredients after losing considerable market share to Patanjali.

Unlike other commercial products, Ayurvedic preparations were not marketed earlier. Moreover, commercial production of Ayurvedic medicines has been seen only in recent decades when the demand is increased and the physician is unable to fulfill it by preparing it himself which was done earlier. With the changing situation in lifestyles, customer is looking for a supply of readily available and immediate usable medicinal preparations. This has given filip to circa 7000 Ayurvedic companies preparing about 1000 single drug and 8000 compound drug formulations. New and effective formulation are being churned out by R&D departments addressing consumer expectations. Some have also been patented and sold as part of the marketing mix.

Additionally the category called "dietary supplements" was not present in India before but now it is rapidly increasing its domain. The Indian Food Drug and Cosmetic Act has grandfathered Ayurveda and as such products are regulated as drugs. Any product based on the classical Ayurvedic formulary can be sold in the Indian market without any prior approval. Being classified as a drug, health and disease claims are permitted. While there are many products sold "over the counter," a majority of the products are required to place the statement that the product must be used under the supervision of an Ayurvedic physician. The other difference between India and the U.S. is that there is widespread acceptance of Ayurveda as a treatment option in India. There are more than 700 Ayurvedic hospitals with more than 35,000 beds and 435,000 Ayurvedic physicians. All of this makes treatments and product prescriptions more readily accessible compared to the U.S. or Europe which are the potential markets of the Ayurvedas. As a matter of fact, mainstream Indian consumers, much like their U.S.

counterparts, prefer conventional allopathic medicines. Sales of the Indian pharmaceutical industry far outpace sales of the Ayurvedic industry. Yet this trend is changing. Ayurvedic herbal medicines in India also cost less than drugs. The retail value of the Ayurvedic products market in India which was around $1.2 billion in 2005 reached $2.6 billion by 2012 and as mentioned earlier is $ 4.4 billion, or roughly Rs 30,000 crore (end of 2018).

Marketing Challenges: OTC medications are basically similar in nature to daily consumables, such as food and cosmetics products, in a sense that consumers select what they want and purchase the products at retail stores or through online shops. For this reason, in the OTC drugs business, in addition to the core requirements of drug efficacy, safety, and reliability, a product's brand value and retailer's sales capabilities are also important. But the most common aspect of these products is that long-standing brands have strong brand loyalty According to industry estimates, India's natural products segment comprised of 41 percent of the personal care products market in 2017, contributing to US$2.5 billion worth of revenue; tier 2 and 3 cities grew the fastest at nine percent followed by eight percent growth in value in major metro cities. South India and the states of Maharashtra, Madhya Pradesh, and Punjab lead national growth in the natural products segment; industry watchers estimate that future growth will be led by Delhi, West Bengal, and Uttar Pradesh. The biggest distribution channel are chemist shops, which led to 19.4 percent value growth for the segment in FY 2016-17. By 2022, India expects the market for Ayurvedic products to rise threefold to US$8billion.

There is a supposition that the knowledge of classical medicines that are manufactured by the Ayurvedic pharmaceutical companies need very less marketing as they have stood their time and the knowledge is well known among the public. But the patent medicines that are manufactured solely by a company that has its proprietorship have to be marketed effectively for its actual sale. Even the group of classical medicinal products of various companies vary in their qualities that have resulted in the limited or decreased use. Hence, the present situation have resulted that the techniques of marketing have to be adopted in all the Ayurvedic Drug Industry also. The market for OTC drugs in emerging economies is growing, with the market in China alone having doubled over the past 10 years, and a look at per-capita spending on OTC drugs also shows sharp growth in many countries. The emerging economies are still in the process of establishing effective drug-related systems, and the use of OTC drugs is incorporated into this process development and expanding at the same time.

Going forward, increasing income levels will likely give rise to greater health awareness, but medical institutions and services are still lacking. As such, further expansion of the OTC drug market is anticipated.

On the other hand, its massive popularity in the West is auguring a bright future of Ayurveda on the global landscape. Growing awareness there about potential side effects of conventional treatments on various media platforms has compelled them to switch to natural, safer, and holistic alternative-Ayurveda. Besides, the myth that Ayurveda is effective only to treat abdominal, skin, and sexual problems has been busted. Ranging from diabetes to cancer and depression to cardiovascular diseases, today, people are relying on Ayurveda to treat a variety of physical, mental, and genetic issues.

Introduction: When an OTC product is new the Company‘s objective will be to influence the target audience of its entry. Television, radio, magazine, coupons etc may be use to push the product through the introduction stage of the lifecycle.

An influencer is a person whose presence is huge on social platforms and has relevant followers. The base of such followers can range from hundreds to millions. Such influencers have relevant posts on their page and targeting them can boost the growth of your business. Pharmaceutical companies looking for new ways to market their products rope in one such influencer to boost their brand presence. For example, if a pharmaceutical company is targeting patients suffering from diabetes then the influencer who is very active on any social media platform and had suffered the same disease in the past, can be approached successfully to seek the attention of people suffering from diabetes. Also, influencers can be helpful in the case of medical products or medical devices. This is one of the best marketing strategies that can help pharmaceutical companies to improve their brand presence on social media channels.

Messaging apps for pharma

Today, messaging apps are one of the most appropriate **marketing strategies** to reach the target customers with valuable and reliable content. For pharmaceutical companies, it provides an opportunity to have a one-to-one conversation with their patients, doctors, and customers. But there are some security concerns which are considered to be unethical, such as: Is the app providing encryption? Are all the regulatory compliance requirements of your **pharmaceutical company** fulfilled by it? Clinical trials recruitment is one of the most interesting application areas of such messaging apps.

Chatbots for pharma

Chatbots are one of the most interesting marketing strategies that are being used by various pharmaceutical companies to respond and engage with clients. Chatbots are programmed and automated scripts that are used to converse directly with the client and mimics the response and behavior of a human being. Such bots can help handle requests like questionnaires, FAQs, and surveys. There are several ways in which pharmaceutical companies can use such chatbots to automate many time-consuming processes and provide more personalized services.

Native advertising for pharmaceutical companies

Native advertising is a kind of advertising that is carried out in the form of an article. The content of such an article is marked with specific labels, such as "advertisement" or "sponsored". It is generally more impactful than traditional display ads when it comes to engagement and interest. Pharmaceutical companies through native advertising can garner the attention of doctors and patients and can raise brand awareness simultaneously. However, there is one challenge associated with this marketing strategy, which is to put together a company regulations-compliant content and get approvals for the same.

Virtual reality in clinical medicine and pharma marketing: Pharmaceuticals companies, healthcare, and biotech industries have been experimenting with VR for a few years and the results are very inspiring. There have been various use cases of virtual reality and augmented reality in expanding pharma and clinical medicines. This includes training and education, therapeutic uses, and health product demos. Such marketing strategies can be successful only when pharmaceutical companies communicate with patients not only for target purchasing but to decipher consumption habits, drug adherence, and so on.

Growth: As the OTC product becomes accepted by the target market Company‘s works on the strategy of further increasing brand awareness to encourage loyalty.

Maturity: At this stage with increased competition the Company‘s take persuasive tactics to encourage the consumers to purchase their OTC product over their rivals. Any differential advantage will be clearly communicated to the target audience to inform of their benefit over their competitors.

Decline: As the OTC product reaches the decline stage there is need to remind the consumer to slow the inevitable.

Advertising of non-prescription medicines has a number of positive benefits for public health in general, the marketplace, and the individual patient. The objective behind OTC **advertisement** is to alert the public to their condition and the availability of personal treatments. Since advertising of consumer products is limited by the amount of information that can be conveyed, its role resides simply in attracting attention and raising awareness. Other communication channels such as product labels and leaflets are more important for presenting larger amounts of detailed information.

Marketing strategies: Technological advancements and the healthcare industry are very closely associated. Recent advancements are mainly intended to improve treatments and therapies. However, when it comes to pharmaceutical companies, technological developments bring about a change in the way the companies operate and market their specific products – especially due to the legal and compliance restrictions in various regions Marketing strategies combines all of its marketing goals into one comprehensive plan by which the organization delivers its value to the customers. These strategies contribute towards growth of OTC segment in consumer healthcare with great market expansion. However the pharma companies switching from prescription medicines to OTC product strategically requires new perspective of marketing OTC product in existing as well as untapped market.

Strategies for pharmaceutical marketings: The organization market position and its competitor‘s strategies decided the competitive position along a spectrum from market leader to market niches’.

1. **Market leader**: Among the majority of Pharmaceutical companies there is one firm that is Generally recognized to be the leader. It typically has the largest market share and, by virtue of its pricing, advertising intensity, distribution coverage, technological advance and rate of new product introductions, it determines the nature, pace and bases of competition. It is this dominance that typically provides the benchmark for other companies in the industry.

The market leadership is often associated with size which is more complex concept and should instead be seen in terms of an organization‘s ability to determine the nature and bases of competition within the market whereas thought leadership‘ is based not so much upon size, but upon innovation and different patterns of thinking.

2. **Market challengers and follower**: Each firm with a slightly smaller market share can adopt one of two stances. They may choose to adopt an aggressive stance and attack other firms, including the market leader, in an attempt to gain share and perhaps dominance (market challengers), or they may adopt a less aggressive stance in order to maintain the status quo (market followers).

3. **Niche market**: Almost every industry has a sequence of small firms that survive, and indeed often prosper, by choosing to specialize in parts of the market that are too limited in size and potential to be of real interest to larger firms. A case in point would be Ranbaxy consumer health care division would concentrate on OTC segments to build specialist market like in case of Revital it has happened in this way that market nichers are able to build up specialist market knowledge and avoid expensive head-on fights with larger companies.

- Leaders: can expand the market, Protect the current share and Expand share.
- Challengers: Discount or cut prices, Cheap goods, Innovate products and .distribution, Improve services, Advertise heavily, Proliferate the range and Reduce costs.
- Nichers: Get smart.
- Followers – Segment carefully, Use R&D cleverly and Challenge conventional wisdoms.

4. **Pharmaceutical marketing strategies for OTC products**: Pharmaceutical industry are specially based on their novel research molecule and when these research molecule looses their market by patent expiry than these drug product switched out their prescription drug to OTC drug product by performing OTC drug marketing. To cover the potential market Pharma companies performed different strategies by creating hybrid models.

5. **Divest strategy**: This strategy involves cutting all promotional and research expenses once

the brand faces direct competition from Revital and redirecting the savings towards brands that are still enjoying patent protection. This strategy leads to the lowest levels of brand building as the brand is not supported and price Competition as the price advantage is not challenged. The success of this strategy depends on the inertia of doctors, patients and the other Stakeholders. When their motivation to switch to the newly-available generic is low, either because of low financial incentives or strong attachment to the brand or to the value of brand equity for funding research and development, such a strategy can deliver high profitability, at least over the short term. One of the major drawbacks of this strategy is that it encourages generic makers to challenge drug patents more aggressively, knowing that the market will be all theirs as soon as they have received the green light.

6. **Value for the money**: Launching of new and improved flavors, packaging, or delivery systems in OTC product can lead to additional emotional or functional consumer benefits. The resulting differentiation enhances the awareness and image of the brand and hence increases its equity. Because these innovations typically do not extend patent life however, it is more difficult to pass the costs on to the consumer when facing generic competition and hence, this strategy‘s lead is one step ahead towards price competition. In addition, these improvements can be easily copied by generics and thus often have only a weak impact on sales,while reducing margins.

7. **Invest in generics**: Pharmaceutical companies try to capture both ends of the market by introducing their own generic. This will reduce the profitability of generic makers and may discourage them from entering the category. The pharmaceutical companies have also realized that producing and marketing generics requires different skills to their traditional business and that it is difficult to be a strong player in both business models. Finally it is inevitable that the competition from generics will erode the profitability of the original brand.

8. **Research molecule strategy**: As pharmaceutical companies are science research based industry they can innovate by launching new forms and dosages or by demonstrating effectiveness for new indications. These researches help pharmaceuticals companies to provide better services for doctors and better communication on the illness and on the brand through higher promotion by the sales force. Although this strategy involves more time,

money and resource utilization but it also create brand value for the organization that produce molecule after research and regulatory approval.

9. Promotional strategies for OTC drug marketing: OTC drugs are promoted directly to consumers as well as physicians and other healthcare professionals and range from analgesics such as paracetamol to anti-histamines. What is categorized as OTC varies from country to country and is dependent on the local legislative framework – usually a national medicines regulatory authority. The various standards are maintain for advertising OTC drug product which are

1. Advertising must be truthful and non-deceptive; not likely to mislead consumers acting reasonably under the circumstances.
2. Advertisers must have evidence to back up their claims.
3. Advertisements cannot be unfair. The sales force should have good knowledge of product and good rapport with doctors as well as with retailers.

10. The **successful positioning of OTC product** can be done when Pharma company follow both Regulatory as well as ethical promotional strategies. Beside this sales force follow PUSH strategies by ensuring product availability by convincing retailers, chemist and doctors with full product knowledge and offers.

11. Push and pull strategies in OTC drug promotion: The ―push‖ strategy makes use by pharmaceutical company‘s sales force and trade promotions to create consumer demand for a product. This strategy is followed by OTC promotions by manufacturer to wholesalers, the wholesalers promote it to retailers, and, finally, retailers promote the drug to patients. In practice, companies may promote their products to pre-wholesalers, wholesalers or pharmacies together or focus on one of them.

A pull strategy is based around the manufacturer promoting their product amongst the target market to create demand. Consumers pull the product through the distribution channel forcing the wholesaler and retailer to stock it, hence the name pull strategy.

12. Sales promotion: This strategy commonly used to obtain an increase in sales short term. Involves using money offering coupons or special offers. OTC. Marketing companies are seen more involved in sale promotion in this new formats of modern trade.

13. Personal selling: The process where businesses use people (the "sales force") to sell the product after meeting face-to-face with the customer. The concepts of direct selling in OTC marketing can be done very effectively as seen in many FMCG products.

14. Direct to consumer advertisements: The consumer-directed advertising has the principal purpose to alert consumers to the availability of products for conditions suitable for self-medication‖. For changing consumer behaviour pharmaceutical companies are performing direct to consumer advertisement for these companies invested 20% of total marketing budget. Under the regulatory laws claims in advertisements, including over-the-counter (OTC) medicine advertisements, must be truthful and cannot be misleading or unfair.

Overall, consumer-directed non-prescription medicines advertising can achieve a number of purposes. It can …..

— increase awareness among patients and consumers about their condition and about the availability of suitable medicines for self-treatment;

— alert consumers to new products and new indications and reinforces other forms of communication about a product and brand;

— develop brand recognition to provide the consumer with confidence in the brand and the Company;

— facilitate product search and helps consumer make informed selections

—stimulate competition in the areas of product quality, product improvement and product development;

— help bring market forces into play, creating competitive product prices; — reinforce the use of good Medicines (always read the label ;)if symptoms persist, consult a healthcare professional‖).

15. **Indian women** fuelled $3 billion e-shopping last year, it is estimated. Rising educational inputs and empowerment will further multiply this trend. Indian women have a long standing love relationship with Ayurveda products. Almost all brands advertise separately for women directed products.[100]

16. Service quality may be defined as the difference between customers' perceptions of the service received and their expectations about service performance prior to the service offering Consumer trust in online shopping is significant to service quality. Communication and **information technology** developments play important roles in online markets to reach a large population of target markets in different geographic locations and specifically in hard to reach areas). Businesses are increasingly trying to obtain competitive advantages through e-commerce for customer interaction. Consequently, it is of interest for practitioners and academics in the field of online shopping and other fields to conduct an analysis of customer evaluations of online shopping
17. Owing to the **Internet and Internet-based technologies development**, online customers are increasingly acquiring unconstrained access to information required and they are being offered a veritable array of product and service choices in competitive prices. This is the reason why some customer purchases are generally based on online appearance pictures, quality information, images and video clips of the product as opposed to physical and actual experience). With the increasing competition in e-commerce, it becomes imperative for online retailers to examine and study customer's attitude toward online shopping). Service quality may be defined as the difference between customers' perceptions of the service received and their expectations about service performance prior to the service offering). If service performance does not meet expectations, people will think that the service quality low. However, when performance goes over expectations, the perception of the service quality is higher). Therefore, customers' expectations are crucial in evaluating service quality. In addition, found that when service quality increases, intentions to use the service or product and satisfaction increase

OTC marketing strategies for Ayurvedics: Today in competitive market, the marketing strategies play vital role in promotion of products and services. There are many pharmaceutical companies in

the industry competing with each other. Pharmaceutical companies are changing their marketing strategies to cope up with new challenges in the business environment. For last decade the Marketing strategies have changed significantly in Indian pharmaceutical industry. There is huge advertising their OTC products to promote them into the market. In his study the author has tried to put emphases on the importance of marketing strategies in the promotion of OTC drugs. Marketing is defined as satisfying needs and wants through an exchange process. Within this exchange transaction customers will only exchange what they value (money) if they feel that their needs are being fully satisfied; clearly the greater the benefit provided the higher transactional value an organization can charge. OTC drugs marketing strategies are very important aspect of any pharmaceutical industry especially what happens when a pharmaceutical products losses the patent protection, it is essential to consider whether radical change is really necessary. It may be possible that the pharmaceutical Product is operating in a niche category that is too small to attract challenging generic Competition, at least in the short term. It could also be that the awareness and image of the brand is so strong in patients' and doctors' minds that it would retain most of its equity even after the loss of patent protection. Marketing strategies available for a prescription drug facing competitive environment from existing generic product involve a trade-off between brand building and price competition. A company can also resort to no marketing oriented strategies such as legal efforts to extend patent protection or tactical alliances with generic makers and can simultaneously implement different strategies, thereby creating a hybrid model.

Low Price strategy:

Narrowing the price gap with others addresses the main problem created by the expiry of any beholden patent; that the equity of the brand can no longer sustain a large price differential with what is, essentially, the same product. At the extreme, comparing the price with the generic will make doctors, pharmacists and regulators indifferent between the two and may force the weakest generic makers out of the business, given their lower economies of scale. On the other hand, price competition invites retaliation and can quickly degenerate into a price war that would kill all the profits in the category. Another issue to be kept in mind here is that most doctors who prescribe the drug are not aware of prices. Communicating the price to the consumers is therefore an integral part of this strategy

Divest strategy:

This strategy involves reducing all promotional and research expenses once the brand faces direct competition and redirecting the savings towards brands that are still protected with patent. Sometimes, this marketing strategy actually involves price increases to take benefit of the higher brand equity of the brand among the smaller segment of hard-core loyal customers.

RECENT TRENDS

Changing life style Approach to different pricing, improved lifestyle and chemical-free products have become the new standard for Indian consumers to get the upper hand Ayurveda. Ayurvedic FMCG companies are integrating their accessible business portfolios which are moving towards divestments, mergers and acquisitions. The example in the Indian market, Dabur India stakes maximum Indian market share for health care category. It shows its existence in a specific herbal fieldIt has 69% and 62% hair oil market share is Saudi and Egypt respectively.

Premiumization: Premiumization has created the bridge between the desirability of the luxury world and the function and necessity of the mass market. But as more brands look to 'premiumise' their offers, the way to express this new focus on specialness needs to be more than just skin deep. Today consumers are willing x to buy premium goods at high prices on behalf of ease, health and wellness. Premiumization is actually a means of growth. premiumization is more benefits offered at the same price. Hair oil keep hairs moist only but if hair oil contains Ayurvedic ingredients, that prevents hair loss and provide nourishment, then all of us are ready to pay extra money for it. Current trends of toothpastes with Ayurveda etc is catching on globally. It is a route to creating desire, excitement and newness in these new entrants.

Innovation: The main purpose of innovation marketing is to open up new markets and ultimately lead to an increase in the business' sales. Innovation marketing also aims at newly positioning the business' products as well as addressing the customers' needs. As the dynamics of business keep changing on a daily basis, so are the marketing strategies. However, the old conventional marketing strategies are no longer effective due advancement of the business world more so propelled by advancement in technology.

One of the main features that distinguishes innovation marketing is the fact that it signifies the company's or business departure from the old marketing strategies. Thus, innovation marketing should be able to highlight the progress in business by using new marketing methods that have not been used before.

These new methods can be adopted from other businesses, basically by learning the market trends and adapting to change, or, it can be a totally new marketing idea brought in by the business. These new marketing methods can also be implemented on both new and existing products and services.

- **L'Oreal –** This is a French cosmetics company with a strong foothold in the cosmetics industry all over the world. One way in which cosmetic companies market their products is by having exhibitions where people get to sample makeup as well as other cosmetics for free. In order to reach a wider customer base in this digital world, L'Oréal developed an App called the L'Oréal makeup genius. This app allowed users to do a digital makeover and by doing so they were able to sample the best makeups that suited their skin tones. The app was a huge success, being downloaded more than seven millions times.
- **Netflix –** Currently Netflix is a household name. Within a very short period of time Netflix has transformed to one of the largest companies in the world. It is no longer a video streaming channel only as they have been able to produce some of the best movies in the recent past. Before growing and becoming one of the most influential companies in the entertainment industry, Netflix embarked on a strategy they called "reverse engineering Hollywood." This involved collecting a large stockpile of data on the emerging trends and marketing directly to satisfy customer needs as well as building a brand of their own.

Consumers have started demanding customized products especially in accordance with their personal taste and needs. Many Ayurvedic companies have established innovative product portfolios for a new customer. They are moving ahead through revolutionizing and improving natural products for youth. From Kwatha (for the treatment of cold and cough) in a sachet, tea sticks formats, gel toothpaste, ready-to-drink (aloe Vera and amla) juice.

Market consolidation: Numerous companies are continuous investigating the business perspective of foreign and several regional market places.Emami group seized ₹ 1,651 crores for the Rs 730 crore Kesh King brands of hair and scalp care products from Zandu Pharmaceutical and SBS Biotech in 2008. The multinational brand (HUL, ITC) has emerged to be affected. Unilever is promoting Lever Ayush with an advertisement with celebrity, who is currently piggybacking on the change of Ayurveda. In reality, Unilever is paying no attention to the multinational corporations (MNCs) eligibility for its advertising.

Network distribution Companies are currently focused on improving their distribution network to increase their connectivity in rural India. Patanjali and Sri SriTattva, leading Ayurvedic FMCG

companies, is trying to decrease its paramount time by building its supply channel additional competent and getting retail stores directly from the manufacturing unit.

Packing: Companies are opening smaller stock-maintenance units at a lower price. This helps them maintain margin, keep the volume from price-alert customers and enhance their customer base.31 VIII. Increased hiring from tier II/III cities A report from the Confederation of Indian Industry (CII) and the Boston Consulting Group (BCG) showed that e-commerce is participated in a major way for the development of the FMCG sector. The report recommends that companies are focusing their attention on tier II and III cities and rural areas, as purchasing power from these areas will be very tremendous. Small town and cities of India are considered to contribute more to the future demand for FMCG sector, whereas e-commerce companies will contribute to a large portion of sales for these companies. It has been said in the report that companies will need to pay attention to level II and III cities and rural areas because their profits will be an essential source of demand for the region as more and more consumers go ahead with non-branded to branded sections.

Market consolidation: Numerous companies are foreying into several regional marketplaces as well as abroad. Emami group seized ₹ 1,651 crores for the Rs 730 crore Kesh King brands of hair and scalp care products from Zandu Pharmaceutical and SBS Biotech in 2008.The multinational brand (HUL, ITC) has emerged to be affected. Unilever is promoting Lever Ayush with an advertisement with celebrity, who is currently piggybacking on the change of Ayurveda. In reality, Unilever is paying no attention to the multinational corporations (MNCs) eligibility for its advertising.

Network distribution: Companies are currently focused on improving their distribution network to increase their connectivity in rural India. Patanjali and Sri SriTattva, leading Ayurvedic FMCG companies, is trying to decrease its paramount time by building its supply channel additional competent and getting retail stores directly from the manufacturing unit.

Packing :For offering safety and quality products, the industries were offering active and intelligent packaging technologies. This technologies are enhanced the shelf life of products as well as safer. In addition companies are opening smaller stock-maintenance units at a lower price. This helps them maintain margin, keep the volume from price-alert customers and enhance their customer base.

Rural GROWTH OPPORTUNITIES: The leading corporate of consumer products have a strong distribution network in the rural area. The internet and e-commerce technologies give an advantage to advanced logistics. A report from the Confederation of Indian Industry (CII) and the Boston

Consulting Group (BCG) showed that e-commerce is participated in a major way for the development of the FMCG sector. The report recommends that companies are focusing their attention on tier II and III cities and rural areas, as purchasing power from these areas will be very tremendous. Small town and cities of India are considered to contribute more to the future demand for FMCG sector, whereas e-commerce companies will contribute to a large portion of sales for these companies. It has been said in the report that companies will need to pay attention to level II and III cities and rural areas because their profits will be an essential source of demand for the region as more and more consumers go ahead with non-branded to branded sections.

Global trend Himalaya Pharma were exporting to Russia 40 years ago. Dabur, Emami HUL have started in Middle-East and west. Dabur earns more than 30 per cent of its revenue from international operations. Dabur has launched 30 products on Amazon. Within six months, the plan is to add 80. Dabur is set to benefit immensely from the shift towards herbal and Ayurvedic products. The online store will also offer insights into the medicinal properties of its products. The world is an Oyster for Ayurveda. Ayurveda deserves to adorn the table in every kitchen in the world and the shelf in every medicinal cabinet.

R E F E R E N C E

1. Phillip Kotler, Marketing management, PEARSONS Pub, 2015
2. https://www.pwc.in/assets/pdfs/rc-publications/innovation-in-fmcg.pdf
3. Pharmaceuticals Sector Analysis Report,equitymaster.com, - March 26, 2018
5. Ayurveda 2.0: on the Cusp of Change, John Kuruvilla, Confederation of Indian Industry,Kerala,Nov 23, 2018 [Book/Printed Report]
5. WHO-Essential Medicines and Health Products: Prequalification of medicines
6. THE ANCIENT AYURVEDIC WRITINGS,Michael Dick, MS, https://www.ayurveda.com/resources/articles/the-ancient-ayurvedic-writings
3. https://www.lyfemarketing.com/blog/digital-marketing-statistics/
100. Seehttps://www.mapi.com/products/herbal-supplements/womens-health/womens-health-products.htmlhttps://www.snapdeal.com/product/ayurveda-cure-original-women-power/678239345755

B I B L I O G R A P H Y

Texts –

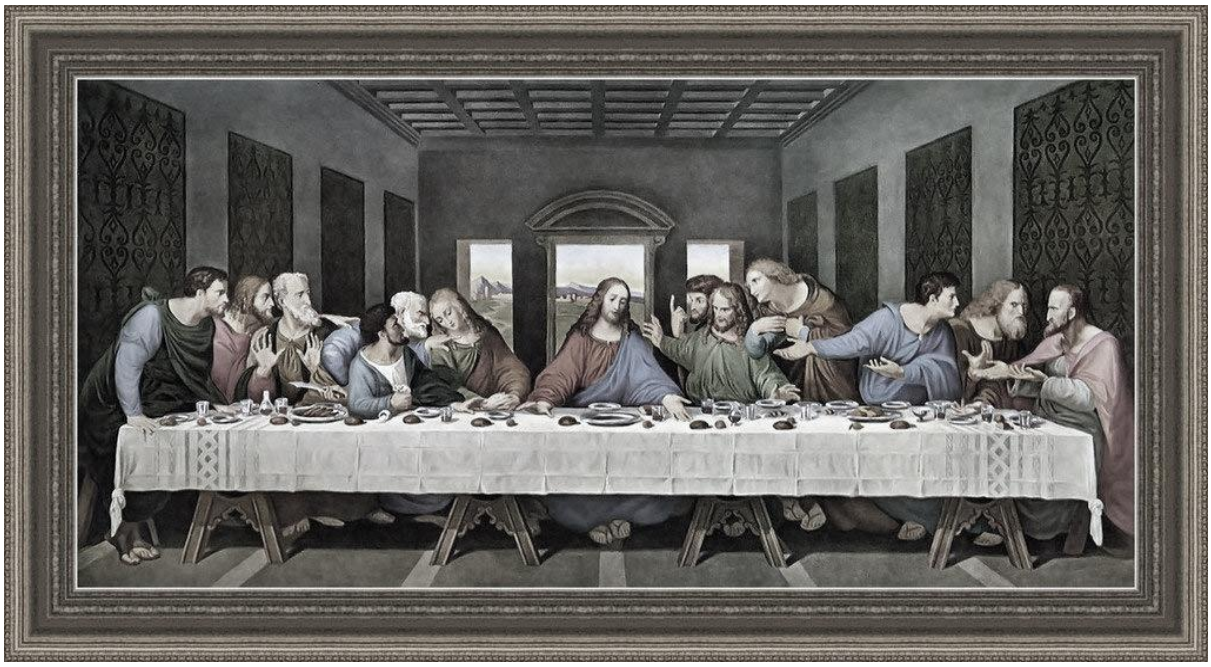
1. Pandith Kashinath Pandey and Dr. Goraknath Chaturvedi, Vidyothini Hindi vyakhya on Charaka Samhita, Chaukhamba Bharati Academy, Varanasi; Reprint-1991.
2. Acharya Sushruta, Sushruta Samhita, with Ayurveda Tatva Sandipika Hindi commentary by Kaviraja Ambikadatta Shastri, Chowkambha Sanskrit Bhavan, Varanasi; 11th Edition-1997.
3. Acharya Vagbhata, Ashtanga Hridayam, Edited by Bhishagacharya Harishastri Paradakar Vaidya, Published by Chowkambha Orientalia Varanasi; 8th Edition,1998.
4. Acharya Vagbhata, Ashtanga Sangraha with Sarvanga Sundari vyakhya by Sri.Pandith Laluchandra Shastri Vaidya, Baidyanath Ayurved Bhavan Printer Limited, Nagpur; 3rd Edition-1986
5. Acharya Sharangadhara, Sharngadhara Samhita with Subhodini vyakhya, Chowkambha Orientalia Varanasi; 7th Edition-1988.
6. Rasavaidya Jaminidas Changnlal Shaha, Bharata Bhaishajya Ratnakara, Motilal Banarasidas Delhi; Volume III, Reprint-1985.
7. Rasavaidya Jaminidas Changnlal Shaha, Bharata Bhaishajya Ratnakara, Motilal Banarasidas Delhi; Volume I, Reprint-1985.
8. Ayurvedic Pharmacopoeia of India, Government of India, Ministry of Health and Family Welfare, Department of Health, 1st Volume. 1st Edition – 1989.
9. Ayurvedic Pharmacopoeia of India, Government of India, Ministry of Health and Family Welfare, Department of Health, 1989, 3rd Volume, 1st Edition –1989.
10. Ayurvedic Formulary of India, Government of India, Ministry of Health and Family Welfare, Department of Health, Part I, 1st Edition – 1978.
11. Vaidya Yoga Ratnavali, IMPCOPS, Chennai, 5th Edition – 2000,II
12. R. M. Mehta, Pharmaceutics, Vallabh Prakashan, New Delhi; Part I, 3rd Edition, Reprint – 2003. R. M. Mehta, Pharmaceutics, Vallabh Prakashan, New Delhi; Part II, 3rd Edition, Reprint – 2003. R. S. Satoskar et.al, Pharmacology and Pharmacotherapeutics, Popular Prakashan, Mumbai; 19th Edition – 2005.
13. Sharma PV. Delhi, India: Chaukhambia Orientalia; 1994. Caraka Samhita (English translation)
14. Valiathan MS. Chennai: The Legacy of Caraka. Orient Longman; 2003.
15. Mishra B. In: 9th ed. Bhavmishra, Bhavprakasha Nighantu, editors. Vol. 1. Nighantu, Varanasi: Chaukhambha Sanskrit Sansthan; 1999.
18. Frawley D, Lad V. The Yoga of Herbs. Delhi, India: Motilal Banarsidass Publishers Pvt Ltd; 1994.
19. Sharma PV. Chikitsa Sthana, Chapter 28. Delhi, India: Chaukhambia Orientalia; 1994. Caraka Samhita (English translation)
20. Srikanta Murthy KR. Delhi, India: Chaukhambia Orientalia; 1993. Madhava Nidanam (roga viniscaya) of Madhavakara (English translation),
21. Patwardhan B, Kalbag D, Patki PS, Nagsampagi BA. Search of immunomodulatory agents: A review. Indian Drugs. 1991;
22. Upadhyay SN. Therapeutic potential of immunomodulatory agents from plant products. In: Upadhyay SN, editor. New Delhi: Narosa Publishing House; 1997.

23. Katiyar CK, Brindavanam, Tiwari P, Narayana DB. Immunomodular products from Ayurveda: current status and future perspectives. In: Upadhyay SN, editor. Immunomodulation. New Delhi: Narosa Publishing House; 1997.
24. Rege NN, Thatte UM, Dahanukar SA. Adaptogenic properties of six *Rasayana* herbs used in Ayurvedic medicine. Phytother Res. 1999;
25. Ziauddin M, Phansalkar N, Patki P, Diwanay S, Patwardhan B. Studies on the immunomodulatory effects of Ashwagandha. J Ethnopharmacol. 1996;
26. Sharma PV. Chikitsa Sthana, Chapter 28. Delhi, India: Chaukhambia Orientalia; 1994. Caraka Samhita (English translation)
27. Sharma PV. Chikitsa Sthana, Delhi, India: Chaukhambia Orientalia; 1994. Caraka Samhita (English translation)
28. Srikanta Murthy KR. Delhi, India: Chaukhambia Orientalia; 1993. Madhava Nidanam (roga viniscaya) of Madhavakara (English translation).
29. Chopra A, Gore A, Paranjape S, Edmonds J. Program of the 8th APLAR Congress, Melbourne, Australia, April 21-25, 1996. Victoria, Australia: ICMS Pty Ltd; 1996. Modified Health Assessment Questionnaire: An Indian study for validity and relevance; p. 87.
30. Patwardhan B, Vaidya A, Chorghade M. Ayurveda and natural products drug discovery. Curr Sci. 2004;86:
31. Sumantran VN, Kulkarni A, Chandwaskar R, Harsulkar A, Patwardhan B, Chopra A, et al. Chondroprotective potential of fruit extracts of Phyllanthus Emblica in Osteoarthritis. Evid Based Complement Alternat Med. 2008;5:329–35.
32. Engel LW, Straus SE. Development of therapeutics: Opportunities within complementary and alternative medicine. Nat Rev Drug Discov. 2002;1:229–37.
33. Mashelkar RA. Second World Ayurveda Congress (Theme: Ayurveda for the Future)–Inaugural Address: Part III. Evid Based Complement Alternat Med. 2008;5:367–9.

Websites –
o www.wikipedia.com
o www.businessdictionary.com
Articles – o A new era of Ayurvedic Herbs – article by Mr. Ranjit Puranik and P K Dave, Published in Neutraceuticals World, November 2009 Edition at www.
13. Ayurvedic Pharmacopoeia of India, Government of India, Ministry of Health and Family Welfare, Department of Health, 1989, 2nd Volume, 1st Edition

C H A P T E R 20

AYURVEDA ON EVERY TABLE- THE NEW AGE



All great changes begin at the dinner table. Ronald Regan,US President

A B S T R A C T

Ayurvedic drugs have been used in different forms right from the ages. It is obvious that their use and benefits have not been marketed all through the period because the development of formulations and its use have been done directly by the physicians. But due to the changes in situations and environment of modern world that the forms and preparations of these medications have become commercialized and that the responsibility is taken up by various pharmaceutical companies. This resulted in large scale production, by different companies which has resulted in rapid commercialization and a competitive arena for the medications. Hence, the new setup has meant that these products adorn our dining tables, kitchen cabinets, medicine cupboards and are more a part of our lives than before. This success will shoot up even further when product meets the quality, safety and efficacy parameter under the regulatory requirements which can create brand picture in the mind of consumers. And effective marketing strategies highlights the wisdom and benefit of this ancient science.

Introduction: Ayurveda is an indigenous ethnic medical system in popular practice in the Indian subcontinent since the pre-biblical era. It is said that Ayurvedic knowledge originated in India more than 5,000 years ago -no wonder it is called the "Mother of All Healing." It is said to have originated from ancient Vedic culture and was taught for many thousands of years in an oral tradition from accomplished masters to their disciples. Some of this knowledge was set to print a few thousand years ago, but much of it is inaccessible. The principles of many of the natural healing systems now familiar in the West have their roots in Ayurveda, including Homeopathy. Ayurveda is considered by many scholars to be the oldest healing science. In Sanskrit, Ayurveda means "The Science of Life."

According to the World Health Organization, about 70–80% of the world populations rely on non-conventional medicines mainly of herbal sources in their healthcare. Public interest for the treatment with complementary and alternative medicine is mainly due to increased side effects in synthetic drugs, lack of curative treatment for several chronic diseases, high cost of new drugs, microbial resistance, and emerging diseases. Although Ayurvedic treatment may be considered effective; proper mode of action, pharmacology, pharmacokinetics, and pharmaco-vigilance of many important Ayurvedic drugs are still not fully explored. Moreover, the comprehensive knowledge of the basic ideologies of Ayurveda is poorly acceptable scientifically due to lack of evidence. The First International Congress on Ayurveda was held in Milan, Italy in March 2009 and it has been the first scientific event of this kind in western world. This ground-breaking international congress was devoted to human being as the product of interactions between Awareness, Environment and Health, subjects that the West tends to consider separate and independent, but that are believed deeply connected in Ayurveda, whose interdependence defines "The Meaning of Life".[1] There is today a fast growing body of evidence supporting the effectiveness of Ayurveda in treating chronic diseases. We need to understand that Ayurveda is much bigger and deeper than just herbal medicines and Yoga.

Where some pharmaceutical drugs have failed, the principles of Ayurveda and its herbs have succeeded. What is exciting is that current studies are beginning to prove this ancient wisdom scientifically. Take turmeric, for example, a much-used root in Ayurvedic formulations and meals, known for its active ingredient curcumin and its anti-inflammatory and anti-bacterial properties, now so prevalent on the market and widely accepted. And even more powerful is the integration of modern medicine with ancient Ayurveda to reach new levels of healing, gaining results for some patients where every other treatment or drug has failed them. "Ayurvedic medicine is ancient, its resurgence is necessary because we do need the proper balance in our medical approach." Maya Tiwari [2]

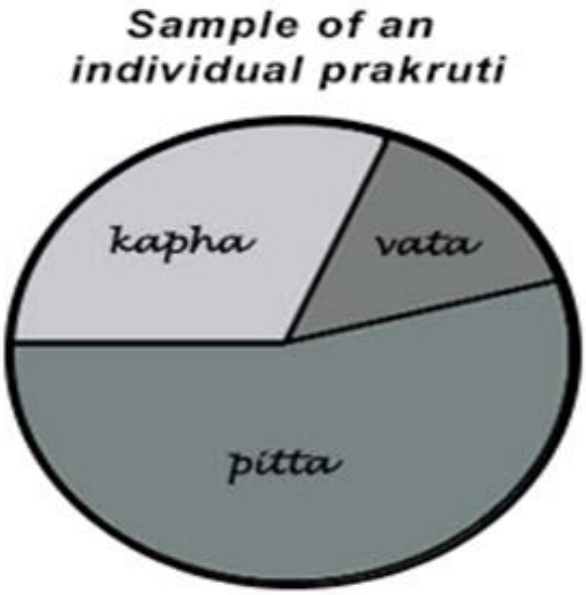
The system's core strength is its holistic approach to health and disease using natural remedies derived from medicinal plants and minerals. Laying emphasis on self-discipline and modest living with high human values, the system strongly advocates a unique set of principles and guidelines on diet and exercise in daily healthy living.

The classical Ayurvedic system was probably driven by insight, intuition, and astute observation of human behaviour and nature. "The soil is more important than the seed" concept underlies several Ayurvedic treatment strategies. A delicate balance between bio-physiological forces (*dosha*) and constitution (*prakriti*) is said to determine health and disease; several other "players" like "mind" and "metabolic fire" (*agni*) play important roles. Ayurveda's principle therapeutic aim is to harmoniously restore that balance. Man is regarded as bearing a structure transcending all matter in the universe, animate and inanimate. This commonality makes "man a replica of the universe." Plants are no exception, all matter has medicinal value.

This is known as the Sattvic approach.

WHAT IS SATTVIC - सात्त्विक ?

Sattvic is a Sansktrik word which translated means 'pure essence'. It is a diet based on certain prescribed foods recommended by Ayurveda, that are considered holistic in nature- nurturing mind, body, and soul, and therefore contributing to good health, disease free existence, yoga and meditation practices of the partaker. Thus this ancient practice gives clarity of both the mind and body. Ayurvedic practitioners often report they can concentrate better, sleep better and feel less anxious overall. Ayurveda's basic perspective: "no two individuals are alike" holds, even when they suffer from seemingly similar ailments. Also, advice on diet, exercise, and lifestyle are inherently bound to its basic therapeutic approach. Rather than seeking support from laboratory or imaging investigations, Ayurvedic physicians use subtle clinical methods to diagnose and monitor therapeutic response.



How Ayurveda works: Ayurveda has an extensive pharmacopoeia, predominantly herbs and minerals. Their healing properties are well summarized in modern texts. Ayurvedic formulations, often complex with several herbal-mineral ingredients, are governed by well-described pharmacological principles of preparation, compatibility and administration. In some complex, well-controlled physicochemical processes convert raw metals and minerals into potent medicines known as *bhasmas*. Although classic texts contain descriptions of classic formulations, traditional Ayurvedic practitioners often modify them to suit the individual constitution (*prakriti*), which confers genetic predisposition toward disease and therapy response, and is vital to ensure medication safety. Safety is inherently bound to efficacy, forming an important endpoint when preparing an Ayurvedic formulation. The medicinal clout of a preparation is a function of its situation interior to the body, not merely as an isolated plant extract. Our non-ayurvedic symptomatic modern science defines molecular structure but Ayurveda ignores this definition if not abandons it in totality. It is of no particular significance in determining a formulation's therapeutic properties. The developing enthusiasm for utilizing Ayurvedic medicine as a gentler, more secure alternative to utilizing advanced pharmaceutical medications with attendant side effects is gaining grounds as viability and wellbeing are now being sponsored with proof and clinical information.[3]

Biomedicine, in contrast, is founded on the reductionist approach to health and disease, and attempts, first and foremost, to eliminate pathology. Although clinical evaluation is of paramount and critical

importance, science as such is extremely impersonal, and, when treating patients, generally cuts across individual differences (genetic or other). Proneness to disease and prevention thereof are more environmental and genetic issues.Diagnostic therapy has medicines as its core strength – well-tested under laboratory and clinical trials with efficacy/safety trade-offs.

Your Constitution and Its Inner Balance

Ayurveda places great emphasis on prevention and encourages the maintenance of health through close attention to balance in one's life, right thinking, diet, lifestyle and the use of herbs. This use of herbs is only a part of the treatment 10-15%. Years ago, 1967 I think, my grandfather Dr. Vasant Dokras was invited to Tehran for the coronation of the Shah of Iran –Mohommad Reza Shah Pehelvi. There, the aunt of the Shah, who was suffering from warts all over her body, requested him to send some ayurvedic medicine from India as all other curatives had failed. My grandfather acceded to her request but to his surprise the Ayurvedic vaid(doctor) in India expressed his inability to give any medicine not having any insight into the life style, food habits etc. of the patient- putting my grandfather in a spot vis-à-vis the Iranian Royal family. Which brings me to the point that knowledge of Ayurveda enables one to understand how to create this balance of body, mind and consciousness according to one's own individual constitution and how to make lifestyle changes to bring about and maintain this balance. Conversely, knowledge of all these is important in diagnosis and treatment.

Just as everyone has a unique fingerprint, each person has a particular pattern of energy—an individual combination of physical, mental and emotional characteristics—which comprises their own constitution. This constitution is determined at conception by a number of factors and remains the same throughout one's life. In Ayurveda, Food is considered just as powerful as medicine. In fact, there is a *sloka* (writings of the ancient texts of ayurveda) that says "food is medicine when consumed properly." If we eat foods uniquely suited to our physiology, and follow a *sattvic* (life supporting) routine that enhances digestion, our bodies will reap the benefits and we will find that our days will be happier, healthier and filled with real vitality — at any age.

दीपो भक्षयते ध्वान्तं कज्जलं च प्रसूयते |
यदन्नं भक्षयेन्नित्यं जायते तादृशी प्रजा ||

Lamp eats darkness and produces [black] soot!
What food (quality) [one] eats daily, so will [one] produce.

Without getting further and deeper into the pharmacopeia aspects of Ayurveda let me condense the main elements and crystallize them for you, my reader. Here are our top ten ayurvedic dietary must-dos:

Science of Self Discovery

I believe that for every illness or ailment known to man, that God has a plant out here that will heal it. We just need to keep discovering the properties for natural healing."- says Vannoy Gentles Fite, in "Essential Oils for Healing: Over 400 All-Natural Recipes for Everyday Ailments". Ayurveda encourages one to Self-Discovery (find the love in yourself) It is not a comparative thesis. Each of us according to it is truly unique, and is designed so that our approach to our individual life is the most individual way possible. Thus to discover our individual needs, to grow, heal, and reflect on our life is the first essence of Ayurveda. Ayurveda consists of three main body types and personality characteristics, otherwise known as doshas. A **dosha** - दोषः is one of three substances that are present in a person's body. Beginning with twentieth-century literature, there was an idea called "The Three-Dosha Theory" त्रिदोषोपदेश. Authoritative Ayurvedic treatises describe how the quantity and quality of these three substances fluctuate in the body according to the seasons, time of day, diet, and several other factors. Ayurvedic doshas are markedly different from Latin "humors". *Doshas* are the forces that create the physical body. They determine conditions of growth, aging, health and disease. Typically, one of the three *doshas* predominates and determines one's constitution or mind-body type. By understanding individual habits, emotional responses, and body type, practitioners can adapt their yoga practice accordingly. The same applies for Ayurveda treatments focused on alleviating any doshic excesses (illness) via powerful herbs and/or through the improvement of general lifestyle practices such as pranayama, meditation and yoga postures.

The central concept of Ayurvedic medicine is the theory that health exists when there is a balance between the three fundamental bodily bio-elements or *doshas* called *Vata*, *Pitta*, and *Kapha*.

- *Vāta* or *Vata* is characterized by the properties of dry, cold, light, minute, and movement. All movement in the body is due to properties of *vata*. Pain is the characteristic feature of deranged *vata*. Some of the diseases connected to unbalanced *vata* are flatulence, gout, rheumatism, etc. *Vata* is not to be interpreted as air.
- *Pitta* represents metabolism. It is characterized by heat, moistness, liquidity, and sharpness and sourness. Its chief quality is heat. It is the energy principle which uses bile to direct

digestion and enhance metabolism. Unbalanced *pitta* is primarily characterized by body heat or a burning sensation and redness.

- *Kapha* is the watery element. It is characterized by heaviness, coldness, tenderness, softness, slowness, lubrication, and the carrier of nutrients. It is the nourishing element of the body. All soft organs are made by *Kapha* and it plays an important role in the perception of taste together with nourishment and lubrication.

5 types of *vata dosha*	**5 types of *pitta dosha***	**5 types of *kapha dosha***
1. *Prana Vata* - Governs inhalation, perception through the senses and governs the mind. Located in the brain, head, throat, heart and respiratory organs. 2. *Udana Vata* - Governs speech, self-expression, effort, enthusiasm, strength and vitality. Located in the navel, lungs and throat. 3. *Samana Vata* - Governs peristaltic movement of the digestive system. Located in the stomach and small intestines. 4. *Apana Vata* - Governs all downward impulses (urination, elimination, menstruation, sexual discharges etc.) Located	1. *Pachaka Pitta* - Governs digestion of food which is broken down into nutrients and waste. Located in the lower stomach and small intestine. 2. *Ranjaka Pitta* - Governs formation of red blood cells. Gives colour to blood and stools. Located in the liver, gallbladder and spleen. 3. *Alochaka Pitta* - Governs visual perception. Located in the eyes. 4. *Sadhaka Pitta* - Governs emotions such as contentment, memory, intelligence and digestion of thoughts. Located in the	1. *Kledaka Kapha* - Governs moistening and liquefying of the food in the initial stages of digestion. Located in the upper part of the stomach. 2. *Avalambhaka Kapha* - Governs lubrication of the heart and lungs. Provides strength to the back, chest and heart. Located in the chest, heart and lungs. 3. *Tarpaka Kapha* - Governs calmness, happiness and stability. Nourishment of sense and motor organs. Located in the head, sinuses and cerebra-spinal fluid. 4. *Bodhaka Kapha* -

between the navel and the anus. 5. *Vyana Vata* - Governs circulation, heart rhythm, locomotion. Centred in the heart and permeates through the whole body.	heart. 5. *Bharajaka Pitta* - Governs lustre and complexion, temperature and pigmentation of the skin. Located in the skin.	Governs perception of taste, lubricating and moistening of food. Located in the tongue, mouth and throat. 5. *Shleshaka Kapha* - Governs lubrication of all joints. Located in the joints.

There are clear indications when there exists an excess of a *dosha*, throwing the system off balance. For example, with excess *vata*, there can be mental, nervous and digestive disorders, including low energy and weakening of all body tissues. With excess *pitta*, there is toxic blood that gives rise to inflammation and infection. With excess *kapha*, there is an increase in mucus, weight, edema, and lung disease, etc. The key to managing all *doshas* is taking care of *vata*, as it is the origin of the other two.

Prana, Tejas and Ojas

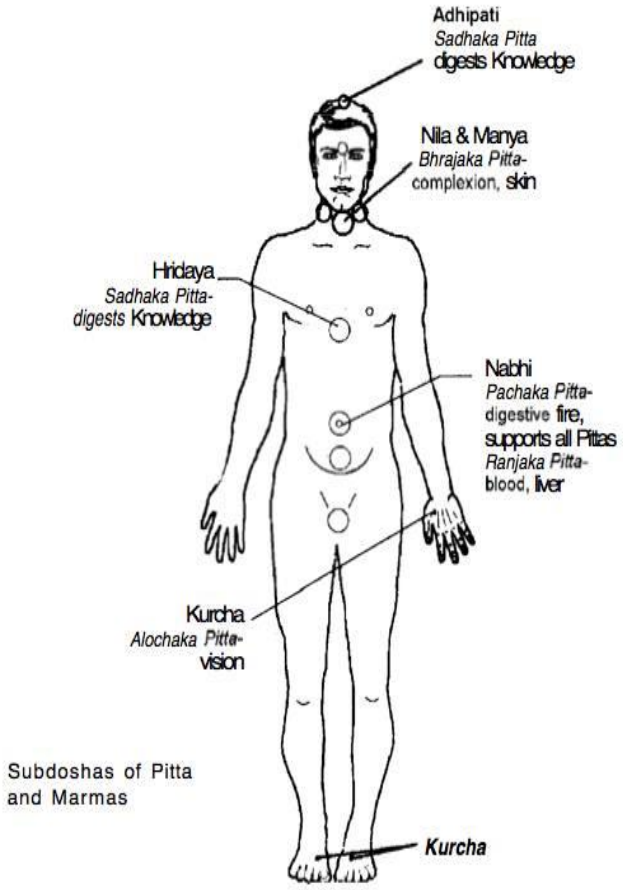
Yoga is an alchemical process of balancing and transforming energies of the psyche. At the roots of *vata*, *pitta* and *kapha* are its subtle counterparts called *prana*, *tejas* and *ojas*. Unlike the *doshas*, which in excess create diseases, these promotes health, creativity and well-being.

1. *Prana* is our life force and is the healing energy of *vata* (air)
2. *Tejas* is our inner radiance and is the healing energy of *pitta* (fire)
3. *Ojas* is the ultimate energy reserve of the body derived from *kapha* (water)

Ultimately, Ayurveda seeks to reduce disease, particularly those that are chronic, and increase positive health in the body and mind via these three vital essences that aid in renewal and transformation. Increased *prana* cultivates enthusiasm, adaptability and creativity, all of which are necessary when pursuing a spiritual path in yoga and to enable one to perform. *Tejas* provides courage, fearlessness and insight, which are important when making decisions. Lastly, *ojas* creates peace, confidence and patience to maintain consistent development and sustain continued effort. Eventually, the most important element to develop is *ojas*, as it

engenders physical and psychological endurance. This can be achieved via Ayurvedic diet, tonic herbs, control of the senses, and devotion.

Introduction to Ayurvedic Drugs – The word drug is derived from the French word ‘drogue’ which means a ‘dry herb’. A drug is defined as ‘Any substance used for the purpose of diagnosis, prevention, relief or cure of disease in man or animals’. According to WHO ‘A drug is any substance or product that is used or intended to be used to modify or explore physiological systems or pathological states for the benefit of the recipient’. There are various sources of drugs namely- Minerals, Animal, Plant, Microorganisms, Synthetic, Genetic engineering and Hybridoma techniques. The system of Ayurveda embraces within its folds drugs of plant, animal and mineral origin, both single drugs and compounded drug formulations. Ayurveda is a medical science that has much wider recognition and prevalence mainly confined to India right from the past as early as dawn of human civilization and the Vedic Period to the present. Out of the total number of 15,000 plant species in India, about 2000 are known to have medicinal properties and since centuries some of them are used as even home remedies in the rural and remotest parts of the country. Although, Ayurveda does not rule out any substance from being used as a potential source of medicine, presently about 1000 single drugs and 8000 compound formulations of recognised merit are in vogue.



All the main classical works on Ayurveda, such as Caraka Samhita, Sushruta Samhita, Astanga Sangraha, Astanga Hridaya, etc. deal with drugs, their composition and action in addition to the other aspects of the medical system. These texts not only mention the compound formulations but also single drug formulations. Writers and communicators of these texts were mainly Ayurvedic practitioners of their time or belonging to their genealogy. As a result there was successful identification, preparation and proper utilization of the drugs either in their single or compound form.

In ancient times, ayurvedic practitioners or vaids were of two types. Those that were in the service of the King and those that lived with common folks and alleviated their sufferings by use of formulations and lifestyle change recommendations. When a folk vaid became famous, the King and courtiers asked for his services and many times made him a part of the Court of the Kings. Thus the texts and practical knowledge of Ayurveda was preached and practiced for centuries. Housewives also asked the VAIDs and on their recommendations treated her kith and kin. Unlike allopathy, Auyrveda is nota

pill popping science but deals with a holistic view of the body and recommends changes in diet and lifestyle to reach a cure. But during the recent period of modernization of India, the changes that have resulted in the social and economic conditions have led to the growth of urbanization and rapid deforestation. As a result, the Ayurvedic physicians took to cities and lost their contact with the forests and drug sources. Thus, the Ayurvedic practitioner could no longer process and prepare his own medicines as in the past, but had to depend on others to cater his need. It is due to this developed conditions and newer socio – economic set up that resulted in the rise of Ayurvedic Drug Manufacturing Industry. This gave birth to crude drug supplying agencies and commercial manufacture of Ayurvedic medicines. This gave rise to a new segment of market which needed the supply of prepared Ayurvedic medicines and in the same way a new set of industry which dealt with the drug manufacturing sector for Ayurveda.

Classification of Ayurvedic Drugs – On through study of various available references the Ayurvedic drugs can be classified into 2 types namely a. Single Drug preparations b. Compound Drug preparations Single Drug Preparations – The single drug preparations consists of only one drug which are of either Herbal or Animal or Mineral in origin. These can be sub classified into 3 types namely:

a. Classical formulations – Classical Formulations of Single drugs are those which are mentioned in the authentic texts of Ayurveda which are enlisted in the Drugs and Cosmetic Act of 1940. These formulations use only one drug and are prepared with reference to the texts. Thus were originally prepared by the physicians of Ayurveda to treat their patients earlier as a practice, but have been stopped by those of modern times due to lack of facilities, drugs, transportation, etc. These kinds of formulations are rarely observed as marketed products in the country. But it is one of the common advices that an Ayurvedic Physician gives during the time of consultation to his patients which are again based on experience and knowledge that he possesses.

b. Folklore formulations – Folklore Formulations of Single drugs are those which are generally not mentioned in any of the texts but are basically practiced on the basis of the knowledge and experience that a folklore practitioner who is an unqualified physician and doesn't belong to the science of Ayurveda. These formulations are more prevalent in the rural areas than in the urban region. Hence marketing of such preparations is purely by those individuals who have experienced the effects of the formulation.

c. Extracts of Single herbs – Extracts of Single herbs is the newest development in the area of herbal drug manufacturing. Here extracts are obtained from complete crude drug and are believed to have a

similar or even more effect with respect to crude drugs. The extraction procedure is more sophisticated and is not performed by any physician himself. The procedure of extraction is generally patented by the manufacturer and hence an extract, even though may be of the same drug, but the method is generally believed to be different. Thus, the advancement being a recent in the period of development, it needs to have a greater marketing strategy and promotions for the acceptance of the same by the society

d. Patent Drug preparations – Patent drug preparations are a set of combination of herbal, mineral or both drugs which are developed by the respective manufacturing companies after a thorough Research and testing. They have been said to have established by a scientific process but have not been in any way mentioned in any classical texts. These may also be those preparations which have been rampantly used in folklore practice and has been established with a strong scientific background. Thus, the advancement being a recent in the period of development, it needs to have a greater marketing strategy and promotions for the acceptance of the same by the society. These various preparations either single or compound formulations of all the groups are in different pharmaceutical forms.

Research shows that Ayurveda can in fact help on a cellular level. It has been indicated that Ayurveda has the potential to actually regenerate cells, again showing that we have the power to begin healing ourselves of certain ailments simply by the way we treat our bodies. While studies are still being conducted, the scientific community is hopeful! The recent decade has witnessed many landmark observations, which have added to the scientific credentials of Ayurveda.It is however believed that instead of a retrospective approach of looking into the Ayurveda through the scientific reappraisals, a prospective approach through primary understanding of Ayurveda followed by a search into scientific linkage would be more appealing.[4]

Eating certain foods

As you begin to eat for your dosha, your digestive system will strengthen. Certain foods will activate your digestive system during the right times of the day, causing a decrease of toxic build up in your digestive tract. This prevents you from feeling lethargic, causing you to have higher levels on energy! Having optimal digestion also helps you to keep a healthy weight and feel less agitated. If food influences how we feel then our discomfort points towards digestive system not firing, being uncomfortable and tired, negative feelings and ultimately affect how you show up in life. Through

incorporating certain dietary elements specifically tailored to one's needs, mind and body clarity can be achieved.

It is said that 75% of the products sold by grocery stores in the United States contain genetically-modified ingredients, or synthetic (non-food) ingredients? What about we in India-it could be 100%. Many of the chemicals and pesticides used in GMO- genetically modified foods have been linked to numerous health issues. Ayurveda might be just the thing as an all-encompassing wellness plan designed to bring true transformation to every aspect of your life. Eat Ayurvedic preparations- not just Chawanprash or the arka of Amla or Bela. But wait, many more preparations incorporating ayurvedic elements into everyday dietary supplements are going to hit the stands.

On eating **naturally intelligent foods**

According to ayurveda, our human physiology is a reflection of the laws of the universe, and the more in tune our lives are with nature, the healthier we are likely to be! Our bodies possess the natural intelligence to process the foods that are closest to nature, such as fresh whole grains and organically-grown fruits and vegetables. Processed foods, on the other hand, genetically-modified foods, and foods to which artificial preservatives or other synthetic chemicals have been added are no longer alive with the intelligence of nature. This makes sense when we consider that we have evolved as a species over millions of years eating whole, natural foods. It is just in the last few hundred years that artificial ingredients and toxic pesticides have been introduced into the food chain. It is no wonder that the incidence of cancer has exploded in the last few centuries. Whenever possible, choose organic, unprocessed foods. According to ayurveda, cancer is one of the most extreme expressions of imbalance in the body. The social and long-term cure for cancer is cleaning up our environment and food chain. How we sow, so shall we reap. When we toxify our mother earth, the result is that our bodies become toxic.

Shun food fads

This is the beauty of ayurveda - it recognizes our uniqueness and gives us a knowledge and perspective that is empowering; that allows us to manage our own health in a very personalized manner. Ayurveda is the ancient science of whole living, not a fad. There are fad diets in the market that come with media hype of new research on certain foods, drinks, or a new diet that is "guaranteed" to work. Keeping up with the latest on what to eat, how, or when, can be a challenge. After all, what works for a million other people may still not be right for us, as each of us is a unique being.

Go for fruits and vegetables

Eat loads of fruits and vegetables, not only for their nutritional value, but also because they are good natural internal cleansers. The specific food guidelines for Vata, Pitta and Kapha can help us pick a variety of fruits and vegetables suited to our physiology and the season. Vegetables do not necessarily have to be just separate dishes. Add them to grains, stuff them in breads, toss them in stews and soups — there's always room for your favourite veggies in every dish. Start your day with stewed apples or pears. Eat a handful of berries for your mid-afternoon snack. Ayurveda prefers bioavailable foods. This means that though vegetables in raw state contain more vitamins and nutrients, they are harder for our bodies to metabolize. Most of us do not respond well to eating primarily uncooked veggies. The goodness of Ayurvedic extracts when blended with cooked food gives us the balance needed to mke a Satvik eating habit. Ready-to-use Churnas which are a mixtures of powdered herbs and or minerals used in Ayurvedic medicine. Triphala a churna for example is an example of a classic Ayurvedic formula, used for thousands of years that is made from the powders of three fruits Amalaki (Emblica officinalis), Haritaki (Terminalia chebula) and Bibhitaki (Terminalia belerica).

According to ayurveda, each meal should contain all six flavors: sweet, sour, salty, bitter, astringent, and pungent. The dominance of the flavors will be based on our predominant dosha makeup. For example, a Vata-predominant person will favor heavier meals with sour and salty tastes. A Kapha-predominant person may favor more pungent meals, and a Pitta-predominant person more sweet flavors. Remember, having all six tastes in our meals means that the spice is present, but it doesn't necessarily mean that we may overtly taste each flavor.

Cleanse from the inside out

The build-up of ama — digestive toxins resulting from improper digestion — in the physiology is, according to ayurveda, the root cause of most disorders. That's worth repeating: The build-up of ama is the root cause of most disorders. Improper digestion can be the result of a few habits that are described in the section and finally completing a cleanse during every change of seasons, to detox and rid the body of ama, is recommended for optimal health. Siping detox tea or ama pachana water. Fresh, sweet juicy fruits are excellent cleansers.

Drink to your health!

Avoid caffeine, alcohol and carbonated soft drinks, and switch to life-giving, vitality-boosting beverages. Start with water, that most basic yet most overlooked drink — drinking lots of warm water through the day helps to rehydrate our system and flush toxins out of the body. Avoid drinking ice-cold water, especially before, during and after meals. If you have a lot of Pitta to balance, drink it cool; otherwise, room-temperature or warm water is best. When we drink ice-cold water, it slows blood flow in the region of the stomach and slows the action of digestive enzymes. Blood flow and digestive enzymes are directly responsible for strong digestion, and anything we can do to support blood flow and enzyme action will help our digestion.

Ayurvedic teas or drinks suited to our physiology, formulated to correct a specific imbalance, can assist in bringing our bodies into balance. There are a wide range of therapeutic Herbal Teas that not only offer comfort any time of the day or night, but more importantly, they are specifically formulated according to the ancient records of ayurveda and have the balancing effect described for each one. Try boiling milk with a slice of fresh ginger, or blended with a spoonful of Organic Rose Petal extract (Gulkand), hot water with lemon are good evening drinks rather than heavier milk.

Cultivate good eating habits-Eat for your soul

Balanced health goes beyond physical wellness to well-being in mind, spirit, emotions and senses as well. The food we eat can nourish our mind, body and emotions, not just our body.Cooking and eating in a harmonious atmosphere turns food into nectar. A pleasant, tidy, cheerful environment and the nurturing company of friends or family will actually make mealtimes more nourishing. One can add life to our years and years to our lives by following a good eating routine, eating on the go, while working, standing up,skiping meals or eating "junk" foods.Eating three regular meals at about the same time each day; making lunch the main meal of the day and cooking and eating fresh food. Leftovers are are to be avoided and giving gratitude, according to our tradition, for the food we eat, and sitting quietly during and for a few minutes after the meal, are recommended.

And finally…….

Remember, the world is our table: Did you know that, according to ayurveda, we metabolize with all five senses? We don’t metabolize just our food….everything we hear, touch, see, taste and smell be imbibe into our system:

1. Pomegranate chutney may be more suitable for you.
2. Avoiding cold drinks at meals and ice-cold foods in general. This is like putting cold water on the burning logs. Iced water, normally served at restaurants, extinguishes the digestive fire.
3. Even juice or milk right out of the refrigerator is too cold for the digestion.
4. Juice should be taken at room temperature and water without ice.
5. Cold drinks and foods mixed with warm cooked foods can cause stomach cramps, bloating and general discomfort in the stomach area.
6. Habit of drinking beverages at room temperature will improve digestion dramatically.
7. If you have a Pitta imbalance, you can take cool drinks in between meals.
8. Cold or frozen foods are not recommended for Pitta either because, even though they may temporarily cool down the heat, the Agni is still being overstimulated and the imbalance will continue.
9. Try slightly cool drinks made with Organic Rose Water, or milk blended with dates or fresh mangos.
10. **Time of the day** that you eat your meals. Late dinners cause a strain next morning and make one sluggish the whole day
11. These are side effects of improperly-digested food. The best way to avoid these problems is to follow nature's prescription of suitable times to eat.
12. Eat when the sun is strongest, between 12 and 2 p.m., is when the digestive fire is also strongest. Agni is associated with the sun.
13. This is one of the ways ayurveda seeks to connect our mind and body with the environment.
14. lunch is the largest meal of the day, since that is the time the digestive agni is working at its maximum potency. As the sun goes down, so does our agni.
15. Dinner should be lighter than lunch, and should ideally be eaten before 8:00 p.m. Late-night meals interfere with sleep, and after 10:00 p.m. the body is working to burn off toxins and continue to digest food from the day.
16. If you eat after 10:00 p.m., the food may cause toxins to accumulate in the system, and as a result the next day you wake up tired.
17. If you are not able to wake up fresh and clear, then it is important to analyze the quantity of food and the time of night you are eating dinner.

1. Another ayurvedic tip for digestion is to drink a fresh yogurt drink called lassi either during or after the meal. This drink consists of ¼ cup fresh homemade yogurt, 1 cup room-temperature water and sugar to taste. Blend it for one minute in the blender. Lassi is light and contains lactobacilli, necessary bacteria that lubricate the intestines to help digestion go smoothly. Lassi drinks help to reduce gas and bloating.
2. Eat sitting down, in a settled environment, without the TV on.

As mentioned earlier, ayurvedic pharmaceutical forms that are explained classically are as given below: These represent the physical characteristics of the combination of active substance and excipients (non-active ingredients) forming a medicinal product (tablet, liquid, capsule, gel, cream, sprays, etc.).Imagine how many permutations, combinations, states and forms can be put out on our staples to enrich the healthier YOU:

1. Asava and Arista – These are medicinal preparations made by soaking the drugs either in powder form or in the form of decoction, in a solution of sugar or jaggery, as the case may be, for a specified period of time, during which it undergoes a process of fermentation generating alcohol, thus facilitating the extraction of the active principles contained in the drugs. The alcohol, so generated, also serves as a preservatives

2. Arka –Arka is a liquid preparation obtained by distillation of certain liquids or of drugs soaked in water using the Arkayantra or any convenient modern distillation apparatus.

3. Avaleha and Paka – Avalehya or Lehya is a semi-solid preparation of drugs, prepared with the addition of jaggery, sugar or sugar-candy and boiled with prescribed drug juice or decoction.

4. Kwatha Churna – Coarse powder of certain drugs or combination of certain drugs which are kept ready for the preparation of kwatha or decoction are known as Kwatha chruna .

5. Guggulu – Guggulu are the exudates obtained from a plant Commophora mukul Linn. Preparations having this exudate as a main ingredient are known as Guggulu.

6. Ghrita – Ghritas are preparations in which ghee is boiled with prescribed Kashayas (decoction) and Kalkas (Pastes) of drugs according to the formula. This process ensures absorption of the active therapeutic principles of the ingredients used. In other words, these are preparations which have ghee as base. The source of ghee is also according to

the formula, but generally Goghrita (Ghee prepared from cow's milk) is used in majority of preparations.

7. Churna – Churna is a fine powder of drugs or a single drug

8. Taila - Tailas are preparations in which oil is boiled with prescribed Kashayas (decoction) and Kalkas (Pastes) of drugs according to the formula. This process ensures absorption of the active therapeutic principles of the ingredients used. In other words, these are preparations which have oil as base. The source of oil is also according to the formula, but generally Tila Taila (Sesamum oil) is used in majority of preparations.

9. Dravaka – Dravakas are liquid preparations obtained from Lavanas (Salts) and Ksharas (Alkalies) by the process of distillation.

10. Kshara – Ksharas are alkaline substances obtained from the ash of herbal drugs14 . k. Lepa – Medications in the form of a paste used for external applications are called as Lepas. These are generally fine powders of the ingredients of the formulation which are packed together and are supposed to be mixed with the liquid specified by the physician.

11. Vati and Gutika – Medicines prepared in the form of tablets or pills are known as Vati and Gutika. These are made of one or more drugs of plant, animal or mineral origin or a mixture of them

12. Vartti, Netrabindu and Anjana – Medicines used externally for the eye come under the category of Vartti (Eye wicks), Netrabindu (Eye Drops) and Anjana (Collyrium) .

13. Sattva – Sattva is a water extractable solid substance collected from a drug after a specific process

14. Kupipakva Rasayana – Drugs of mineral and metallic origin (Rasaushadhi) is well mixed together into a fine powder form and are placed in a glass flask and heated. The obtained medicinal preparation is known as Kupipakva

15. Parpati – Parpati is a medicinal preparation which is in the form of flakes of the compound that are mentioned in the formulation. These preparations are herbo-mineral or mineral in combinations.

16. Pisti – Pistis are prepared by triturating the drug with the specified liquids and exposing to sun or moon light. They are termed as Anagnitapta Bhasma (Bhasma prepared without the medium of fire)

17. Bhasma – Powder of a substance obtained by calcination is called Bhasma.

18. It is applied to the metals and minerals and animal products which are by various specific special processes are calcinated in closed crucibles in muffle furnace.

19. Mandura – These are preparations containing Shodhita Mandura (Iron oxide) along with other drugs. t. Rasayoga – Preparations containing mineral drugs as main ingredients are called Rasayogas. They may be in pill form or in powder form.

20. Lauha – Lauhas are preparations of Loha Bhasma (Iron incinerated powder) as main ingredient added to other drugs.Other than these with the recent advancement in science and technology, there is induction of newer techniques and machineries giving rise to new forms of pharmaceutical preparations in the field of Ayurveda which are as explained below.

21. Dusting Powders – These are meant for external application to the skin and are generally applied in a very fine state to avoid local irritation.

A. Dentifrices – These are applied with the help of tooth brush for cleaning the surface of the teeth.

B. Granules – These are the drugs which are mixed with sugar, flavouring agent and a granulating agent to prepare a coherent mass which is passed through a sieve to convert it into granules.

C. Tablets – These are solid dosage forms of medicament or medicaments which are prepared by moulding or by compression

D. Capsules – The capsules are solid unit dosage form in which one or more medicaments and inert substances are enclosed within a small shell, generally prepared from a suitable form of gelatine.

E. Syrups – Simple syrup is a saturated solution of sucrose in purified water. They are sweet viscous preparations.

F. Elixirs – Elixirs are sweet aromatic preparations and are usually coloured.

G. Linctuses – Linctuses are viscous liquid and oral preparations that are generally prescribed for the relief of cough.

H. Liniments – Liniments are liquid and semi-liquid preparations meant for application to the skin

I. Lotions – Lotions are liquid preparations meant for external application without friction. They are applied on the skin with some absorbent materials like cotton.

J. Sprays – Sprays are preparations of drugs in media which may be aqueous, alcoholic or glycerine.

K. Emulsions – An emulsion is a biphasic liquid preparation containing two immiscible liquids, one of which is dispersed as minute globules into the other.

L. Suspensions – The suspensions are the biphasic liquid dosage form of medicament in which finely divided solid particles are dispersed in a liquid or semisolid vehicle.

M. Ointments – Ointments are semi-solid preparations meant for application to the skin or mucous membrane.

N. Jellies – Jellies are transparent or translucent, non-greasy, semi-solid preparation mainly used for external application to the skin.

Just as the potential of Ayurvedic philosophy and medicines needs to be recognized and converted into real life treatment paradigm. [6]The junction of the rich knowledge from different traditional systems of medicine can lead to new avenues in herbal drug discovery process.[7] The kitchen is the pharmacy and the pharmacy is the kitchen, is a well-known tenet of Ayurveda [8]

'Ayurvedic knowledge has a two-fold meaning. The first is derived from the sense-organs and corroborated by varied evidence based upon the experiences of the sense-organs. From this knowledge comes the physical sciences. The second type of knowledge is transcendent and is realized through the mental and spiritual discipline of yoga. The latter is the subject of the Vedas. Ayurveda is

thus a science of life, a system of health and medicine which aims to assist people in living a healthy life. It provides knowledge of how to live (naturally). Most distinct about ayurvedic medicine is its roots in peaceful, spiritual concepts which connect it to a larger philosophy and way of life. The history of ayurvedic medicine is quite different from the history of other systems of medicine, which are rooted in early capitalism and war. Today Cookies, toothpastes, herbal health drinks, Aloevera based products, soaps,handwashes, honey Ghee, pills, capsules, oils and syrups, derived from aloe vera, amla, ashwagandha, brahmi and garcinia, among others, for problems ranging from coughs and colds to diabetes and digestive system ailments or skin and hair issues all have slowly but steadily made their way into our lives. Let us hope that ayurvedic health will adorn every kitchen in the world

R E F E R E N C E S

1. *Advent of a Link between Ayurveda and Modern Health Science: The Proceedings of the First International Congress on Ayurveda, "Ayurveda: The Meaning of Life-Awareness, Environment, and Health" March 21-22, 2009, Milan, Italy, Morandi A, Tosto C, Sartori G, Roberti di Sarsina- https://www.ncbi.nlm.nih.gov/pubmed/20981327*
2. *http://www.nourishmelbourne.com.au/tag/ayurveda/*
3. *Importance of ayurvedic medicine in modern lifestyle: A keynote review study, Virender Kumar et al,International Journal of Advanced Educational Research ,Volume 1; Issue 4; July 2016; Page No. 31*
4. *Building bridges between Ayurveda and Modern Science, Sanjeev Rastogi, Int J Ayurveda Res. 2010 Jan-Mar; 1(1): 41–46.*
5. *J Ayurveda Integr Med. 2010 Jul;1(3):190-8. doi: 10.4103/0975-9476.72620.*
6. *Ayurveda-modern medicine interface: A critical appraisal of studies of Ayurvedic medicines to treat osteoarthritis and rheumatoid arthritis.Chopra A1, Saluja M, Tillu G. J Ayurveda Integr Med. 2010 Jul;1(3)*
7. *A glimpse of Ayurveda – The forgotten history and principles of Indian traditional medicine yogini S.JaiswalLeonard L.Williams,Journal of Traditional and Complementary Medicine,Volume 7, Issue 1, January 2017, Pages 50-53*
8. *Shroff FM. What is ayurvedic health care and how is it applicable to the Modern Day?. J Nutr Hum Health. 2017;1(2):17-29*

CHAPTER 21

GHEE- घृत The Holy Grail of OTC Market

1. O Agni-and-Vishnu, great [is] that greatness of yours; ye drink of the ghee that is called secret, assuming seven treasures in each house; may your tongue move on to meet the ghee.
2. O Agni-and-Vishṇu, great [is] your dear domain (dhā́man); ye partake of (vī) the ghee, enjoying secret things, increasing by good praise in each house; may your tongue move up to meet the ghee.
Atharva-Veda Samhita/Book VII/Hymn 29 (30)

He is joined with ghrita . His womb (on the altar) is ghrita. He rests on ghrita. His abode is ghrita. Carry hither (the gods) according to thy wont! Rejoice ! Carry, O bull, the offering, over which the Svâhâ has been spoken, (to the gods).p. 200 ***MANDALA II, HYMN 3.ASHTAKA II, ADHYÂYA 5, ARGA 22–23.ÂPRÎ HYMN.***

S Y N O P S I S

Ghee is making a comeback in the Ayurvedic and OTC market, medicines, health foods, foods in general and home cooking-which runs into several billion dollars. Spurred on by urbanization, rise of vegetarianism worldwide, rise of income levels and online marketing trends the world has finally recognized the value of Ayurveda in General and Ghee in particular. When we began to write about Ayurveda we also focussed our telescope on Ghee. One of us, Karan Dokras is working for a company that is marketing Ghee and finding out new and intrinsic blends, packaging ideas and markets.

Ghee is an enormous subject and so we decided to write three papers. The first, this one, is about Ghee in general, the second -about its marketing and the third short one about customization of Ghee.

This, then, is an introduction to a food item that is extremely romantic probably the most romantic in the world and the use and practices-not to mention myths and mythology of this product dates million year in the past. Welc

INTRODUCTION: The very first solid food a mother feeds a baby in many Hindu households is mashed-up rice mixed with a little ghee. In recent years, ghee has become a global phenomenon, trending as a "superfood" and beloved by followers of the popular Keto diet. But its history- real and legendary is long. Ghee originated in India, where the heat was not conducive to storing butter for long periods. But when that butter was clarified-heated until the water evaporates and the milk solids separate away the product had a long shelf life. For thousands of years, ghee has been featured in Indian recipes, and even in Hindu mythology, which attributes its origins to the divine. Food fried in ghee (butter which has been boiled to remove its impurities) was particularly valued. It was classed as 'pakka*',* meaning it is cooked, stable and pure. Conversely, 'kacha' food is vulnerable and subject to impurities. Today too, 'pakka' food prepared with ghee is seen as festive and delicious, served as a sign of hospitality or given as a gift. Ghee is also recommended in traditional ayurvedic medicine to facilitate digestion and, when applied to the skin, to treat burns.

Ghee has also been venerated through the ages for its medicinal properties in Ayurvedic medicine, which prescribes it as a cooling food (it lowers the body's temperature), as a digestive aid, and even as a salve to soothe burns. In "A Historical Dictionary of Indian Food," K.T. Achaya writes that ghee is "strengthening, aids digestion, and acts quite powerfully on the mind, improving the memory and intellect." That's not all. Ghee is also high in butyrate, which reduces inflammation in the body, and it is also rich in vitamin A. It is also perfect for people who are lactose intolerant because hardly any of the butter's lactose or casein remains.

The United States has a particularly amusing history with ghee. In the 1950s, upon discovering that American dairy farmers had more than 260 million pounds of surplus butter, the government had a novel idea: Convert the butter into ghee, and offload it onto the Indian subcontinent, where millions of people adore the stuff. The government took this prospect so seriously that dairy expert Louis H. Burgwald was dispatched to India, where he dutifully peddled the American ghee and got merchants

to sample his wares. The first lesson that he learned was that tastes for ghee varied across the length and breadth of the subcontinent. The ghee preferred in the south and the west (ghee made from the milk of cows) varied vastly from the ghee preferred in the north and the east (ghee made from buffalo milk). Burgwald was enthusiastic, though, and reported back to his bosses that if regional tastes could be catered to, then the Indian subcontinent was ripe for the picking. Eventually, nothing came of the undertaking.

Mythology: The story goes that Prajapati, lord of the creatures, rubbed his hands together to create the first ghee, which he then poured into flames to create his offspring. As a result, ghee is poured into sacred fires by Hindus to this day, a practice thought to be auspicious for marriages, funerals and other ceremonies. It was also extensively consumed as part of a balanced diet. Ancient Sanskrit literature describes ghee as fit for the gods. Modern Indian cooking no longer differentiates in kaccha and Pacca this way, but the practice is carried on in religious ceremonies and cooking for festivals such as the Hindu festival called Navratri.

This is the secret name of Butter:
"Tongue of the gods," "navel of immortality."
We will proclaim the name of Butter;
We will sustain it in this sacrifice by bowing low.
These waves of Butter flow like gazelles before the hunter...
Streams of Butter caress the burning wood.
Agni, the fire, loves them and is satisfied. Rg Veda (circa 1500 BC) in praise of *ghee*

Dairy products are granted special status in Hinduism. According to Hindu mythology, the universe and the earth were created from the churning of an ocean of milk. The anthropologist Marie-Claude Mahias believes that the mention of transforming milk into butter in the Hindu creation myth illustrates a process of 'setting the world in order out of the original chaos'. Milk, yoghurt and ghee (from the Sanskrit ghṛtá meaning 'clarified butter') have long since been used as an offering on altars and likened to the food of the gods. The consumption of milk, yoghurt and ghee has been part of the daily Indian diet since the first millennium BCE.[1]

The lamp has its own special place in Sanātan Vaidik Hindu Dharma. It is a form and a symbol of Tēj (Absolute fire principle). The lamp is invoked as, 'तमसो मा ज्योतिर्गमय ।' meaning the lamp leads us from darkness towards light. It burns only to give the message of peace and light to man. That is its greatness. Amongst the articles of pūjā the lamp is an important article. The following mantra which is recited during the ritual of pūjā explains its significance.

भोदीपब्रह्मरूपस्त्वं ज्योतिषांप्रभुरव्यय: ।।
आरोग्यंदेहिपुत्रांश्चमत:शांतिं प्रयच्छमे ।।

Meaning: O Deity of lamp, you are of the form of Brahman (the absolute truth). You are full of radiance. You never wither. Please bestow me health and good progeny and please fulfil my wishes. The bhog offered to the gods is mostly milk and fruit. Are these their favourite foods or is there some other reason behind it? The explaination is as follows: The earth is known as Vasundhara, that which holds up vasu, or plants. So if the earth is a cow, plants are its milk. In the Vedas, milk is given a lot of importance. Ghee, a milk product, is offered during yagnas to Agni, said to be the hunger of the gods.

Panchamruta contains five milk products — milk, both raw and boiled, ghee, butter and yoghurt. Go-ras, cow urine, honey and jaggery are all mixed in and offered to the gods. In the Puranas, it is said that Vishnu lies on Kshir Sagar, an ocean of milk. So, nature, prakriti, is visualised as an ocean of milk. Whatever you get from nature is like milk — that's the analogy. Which is why gods are always offered milk.

Ghee as foods of Shiva and Vishnu?

One way of looking at it is that Shiva is a vairagi, a tapasvi who wishes to stay away from domestic life, while Vishnu, in the form of Rama or Krishna, lives a householder's life. So Shiva is offered raw unprocessed milk and Vishnu, processed milk products like butter and ghee. Shiva is content with whatever is available. But because Vishnu is a householder, his offerings require effort; he needs manufactured products. To extract the butter from the milk, you have to put in a lot of work, or you will not see results. A lot of value is accorded to shram, labour. So, typically, Vishnu is offered cooked food.

During the Annakuta festival around Diwali, Krishna is offered a mountain of food, the chhappan bhog, or fifty-six items — because food is extremely important for a householder. The food offered matches the lifestyle of the god and it is made from Ghee.[2] Ghee lamp has more capacity to attract the *sattvik* vibrations present in the surrounding atmosphere as compared to oil lamp. It is believed that the oil lamp can attract the *sattvik* vibrations spread over a maximum distance of 1 meter while the ghee lamp can attract*sattvik* vibrations spread over till *Swarga Lok* (heaven). It is said and believed that only Pure Cow Milk Desi Ghee should be used for Puja and other rituals. The word itself 'Abhishekam' or Abhishek is a Sanskrit term that literally means to wet around and involves the ritual bathing of consecrated images. In the Bhakti devotional traditions, temple worship forms a central practice. Hindus regard the different *murthis* (sacred images) as living manifestations of Divinity. Devotees meditate upon the murthis and honour them with mantras or hymns. The murthis are regularly served through different ceremonies such as Abhishekam. Ritual worship is an opportunity for the devotee to express one's love for their deity. It is a chance to physically interact with God, to relate to him on an intimate human level.

SPIRITUAL BENEFITS OF ABHISHEKAM

Generally, there are five main items which are used to bathe the consecrated image:

- Milk (Water) (taste)
- Yoghurt (Earth) (touch)
- Ghee (Fire) (sight)
- Honey (Ether) (hearing)
- Sugar (Air) (smell)

These five together are known as the 'Panchamritam' or the five nectars. Each of them is linked to one of the five elements and indeed one of the five senses. The five elements form the substratum of this material existence and the five senses dictate how we all individually perceive it.When devotees offer the Panchamritam, they are essentially asking Divinity to purify and balance the external physical world around as well as their own subjective perception of it. When each item is poured over the image there is a vibrational effect which transforms the surrounding environment as well as the individuals who are witnessing it. This is why Abhishekam is not just beneficial to the performer, but

also to anyone who is present in the congregation. The positivity and spiritual energy created effortlessly uplifts everyone who attends the ceremony.

The Significance of Abhishekam

1. Abhishekam is the ritualistic washing of the idols of the Gods with substances considered to be sacred. Abhishekam can be quite simple when it's done with water or quite elaborate as in the case of Panchamrit Abhishekam.
2. The process of Abhishekam can be seen as sacrifice or penance to the Gods, by the offering of items like milk, ghee, honey etc. This is done to appease the Gods so we can gain their blessings in our lives.
3. It is an age-old practice that has been going on since the early days of Hinduism. Many religious scriptures highlight the importance of observing the Abhishekam rituals, aimed to please the Gods.
4. The pouring of items on God's idols signifies the devoted affection a bhakt has for his God. The souls of the devotees or priests who participate in this ritual with a pure heart and a clear conscience can get great improvement in their lives, by the grace of God.
5. Drinking the water or milk of Abhishekam after it has washed the lotus feet (or lingam) of God is considered extremely holy in Hinduism. Devotees line up for a few drops of this heavenly nectar after pooja ceremonies, at temples or at their homes.
6. Panchamrit Abhishekam of Lord Shiva is one of the main ways of worshipping the Shiva Linga. It can bring tremendous good luck and prosperity to the material and spiritual lives of devotees, and by Lord Shiva's grace can even save them from all obstacles in their lives.
7. Abhishekam is crucial to any pooja ceremony as much as the chanting of mantras and the performance of aarti. It is also a practice that is unique to Hinduism

THE OUTER AND INNER EXPERIENCE OF ABHISHEKAM

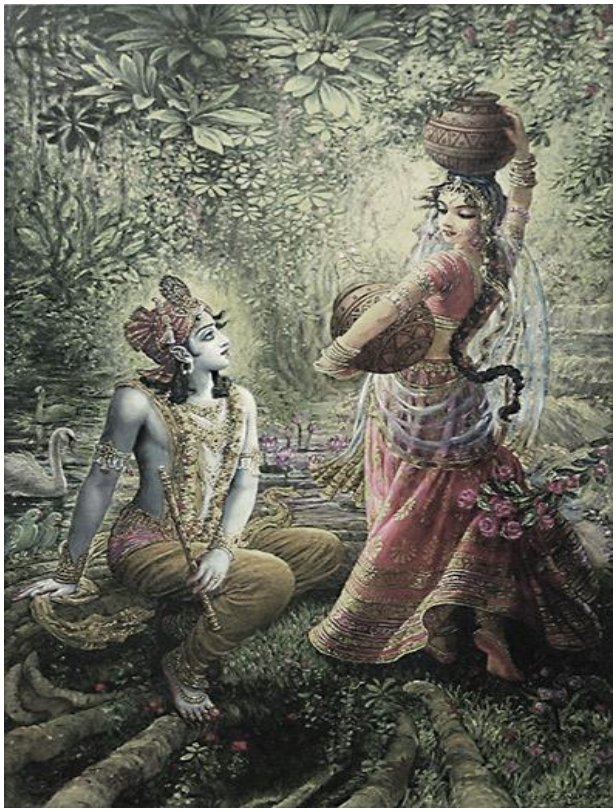
Apart from a strong metaphysical effect, Abhishekam creates a strong devotional connection. To those who deeply absorb what is happening, every act that is outwardly performed is happening on an inner level. When we welcome the deity by washing His feet, that same deity is being welcomed into our hearts. When we honour Him by bathing Him in the Panchamritam, this too is happening within.

The outside events become a deep meditation which profoundly nurtures our loving relationship with God. Divinity is no longer a distant reality but instead becomes an intimate and deep experience.

The life of Sri Krishna

In 3228 BCE in Mathura, India, a child was born who was destined to reshape the spiritual and temporal destiny of mankind—Sri Krishna. In his 125 years of life, Sri Krishna made an indelible impression upon mankind's collective consciousness—re-educating the world about devotion and dharma as well as the ultimate reality. His life was a model for people in days past, the modern world and surely for those in ages to come. Krishna, in fact, took birth in a prison cell. A sage had told his egoistic uncle, King Kamsa, that he would be killed by his sister Devaki's child. So Kamsa imprisoned Devaki and had each child she bore murdered. However, Devaki, and her husband, Vasudeva, finally were able to sneak one child off to safety. This was Sri Krishna. They sent Krishna off to Vraja, where he was raised by a foster mother, Yasoda. It was in Vrindavan, one of the villages of Vraja, that Krishna won the hearts of the gopis, the cowherds of the village. "By spending all his time with the gopis of Vrindavan—playing with them, joking with them, stealing their butter and milk, etc—what he actually was doing was stealing their hearts. The teachings of Krishna consciousness emphasize the many transcendental benefits of milk. The Vedas say the cow is one of the mothers of mankind; cow's milk and its many preparations are a key part of the recommended diet for human beings. Milk is considered essential for the proper development of the human brain, enhancing our ability to understand and apply spiritual knowledge.

Srila Prabhupada, founder-*acharya* of the International Society for Krishna Consciousness, was aware of the exploitative nature of the modern dairy industry. In his books and lectures, he repeatedly condemned the slaughterhouse economy as the crux of all the world's problems and urged his followers to establish self-sufficient, agrarian economies centered on cow protection.



World total milk production in 2017 (including cow/buffalo/goat/sheep/camel milk)

Rank	Country	Production (1000 tonnes/year)	Share in Global Production
	World	**827,884**	100%
1	India	176,272	21.29%
2	United States	97,760	11.81%
3	Pakistan	44,293	5.35%
4	China	34,869	4.21%
5	Brazil	33,742	4.08%
6	Germany	32,695	3.95%

7	Russia	31,177	3.77%
8	France	25,260	3.05%
9	New Zealand	21,372	2.58%
10	Turkey	20,700	2.50%
11	United Kingdom	15,256	1.84%
12	Netherlands	14,544	1.76%
13	Poland	13,702	1.66%
14	Italy	12,027	1.45%
15	Mexico	11,988	1.45%
16	Ukraine	10,520	1.27%
17	Uzbekistan	10,167	1.23%
18	Argentina	10,097	1.22%
19	Australia	8,800	1.06%
20	Canada	8,100	0.98%

]

DAIRY: A dairy is a business enterprise established for the harvesting or processing (or both) of animal milk – mostly from cows or goats, but also from buffaloes, sheep, horses, or camels – for human consumption. A dairy is typically located on a dedicated dairy farm or in a section of a multi-purpose farm (mixed farm) that is concerned with the harvesting of milk. Milk producing animals have been domesticated for thousands of years. Initially, they were part of the subsistence farming that nomads engaged in. As the community moved about the country, their animals accompanied them. Protecting and feeding the animals were a big part of the symbiotic relationship between the animals and the herders. In the more recent past, people in agricultural societies owned dairy animals that they milked for domestic and local (village) consumption, a typical example of a cottage industry. The animals might serve multiple purposes (for example, as a draught animal for pulling a plow as a youngster, and at the end of its useful life as meat). In this case, the animals were normally milked by hand and the herd size was quite small, so that all of the animals

could be milked in less than an hour—about 10 per milker. These tasks were performed by a *dairymaid* (*dairywoman*) or *dairyman*. The word *dairy* harkens back to Middle English *dayerie*, *deyerie*, from *deye* (female servant or dairymaid) and further back to Old English *dæge* (kneader of bread).With industrialization and urbanization, the supply of milk became a commercial industry, with specialized breeds of cattle being developed for dairy, as distinct from beef or draught animals. Initially, more people were employed as milkers, but it soon turned to mechanization with machines designed to do the milking.

Historically, the milking and the processing took place close together in space and time: on a dairy farm. People milked the animals by hand; on farms where only small numbers are kept, hand-milking may still be practiced. Hand-milking is accomplished by grasping the teats (often pronounced *tit* or *tits*) in the hand and expressing milk either by squeezing the fingers progressively, from the udder end to the tip, or by squeezing the teat between thumb and index finger, then moving the hand downward from udder towards the end of the teat. The action of the hand or fingers is designed to close off the milk duct at the udder (upper) end and, by the movement of the fingers, close the duct progressively to the tip to express the trapped milk.

India has come a long way in the field of
diary from being in deficit from 20mn MT IN 1970 to being the world's largest milk producing countr y at 160mn MTaccounting for 18.5% of world production.

In last 35 years, India's milk production outstripped with 4.5% CAGR as against
~1.6% CAGR posted by global milk
Production. Going ahead, India's milk production is expected to outperform global production and grow at similar 4.2% CAGR to 185mn MT per annum/507mn litres per day and surpass EU to emerge the largest dairy producer by 2020 and improve in value terms at ~15% CAGR to INR 9.4tn over FY16- 20.

Key Structural Trends & Drivers of this diary market are:

1. *Rising per capita income*:
   India is the world's largest consumer of dairy products, consuming almost 100% of its own m ilk production. Despite being the world's largest consumer, per capita milk consumption (PC C) in India is 97 litres/year, significantly trailing USA, EU27, Russia Federation and Brazil.

2. *India's per capita milk consumption* increasing at 3% CAGR versus 1% CAGR globally. At 97 litres per year it significantly trails its global peers. There exists enormous scope for Ind ia's per capita milk consumption to spurt led by growth in value- added products (VADP), w hich is at 34% of industry versus 86% for the global mature markets like EU.
3. *Vast vegetarian population*: Latent growth potential for India's dairy industry is huge.
4. *Rising share of organised sector*: Led by rising disposable income, and growing consumer preference for branded and value- added milk & milk products, investments by organised players in the sector has been on the rise.
   The organised players are set to grow at 20% CAGR over 2016- 20
   outpacing industry growth of 15% CAGR, and enhance share in the Indian dairy industry to 26 % from 22% in 2016.
5. *VADP* has been gaining importance with increasing changes in India's demographic and dieta ry patterns. In medium term, while demand for branded milk is expected to grow by 15% C. AGR, VADP would grow even stronger by 20% plus CAGR driven by increasing share of or ganised sector.

Ghee and SMP (Solid milk products): Excess supply of milk from the farmers by dairies is accepted and converted into longer shelf-life products such as skimmed milk powder and milk fats. 1 litre of Cow's milk has 3 components-3.5%fat, 7.5 % SNF and water.
When any company sells standard milk, it sells milk with 3- 4 % fat and saves some fat for the manufacture of ghee and butter.
Ghee can be sold in bulk at ~5% margins. 24- 28% gross margins are possible to be achieved on Ghee. Even though this is less than the 40% on Whey products, still the whey market is in its infancy in India.

EDELWEISS Report on India- Dairy.

Structural levers to script multi- year growth story
The domestic dairy industry is poised to embark on the growth super highway- CAGR of 15% over FY16- 20. We believe structural growth levers are in place to fuel this spurt: wherein: a) Mere 22% (INR1.19trillion) organised pie is set to catapult 2 times , primarily
driven by fresh dairy products (milk, curd,Ghee, paneer, etc) clocking 20% CAGR over FY16 - 20E; b)
Urbanisation is driving strong 2.5x surge in VADP, spearheaded by high- margin emerging categories like cheese, whey, UHT and flavoured milk logging ~25% CAGR versus liquid mil k's
15% CAGR over FY16- 20E; and c) There's a large vegetarian population (31%) with rising income levels and sub- standard protein consumption

December 1, 2017 December 1, 2017 Crème de la crème: Milking the value chain

There are millions of quotes about Ghee in the Holy texts. In the Mahabharata, the Kauravas were born from pots of ghee and no other substance is as widely used to prepare Ayurvedic medicines as ghrita as Ghee is fondly called in Sanskrit. Ghee is a class of clarified butter that originated in ancient India. The word *ghee* comes from Sanskrit: घृत clarified butter', from *ghṛ-* 'to sprinkle'. It is commonly used in Middle Eastern cuisine also;cuisine of the Indian subcontinent, Southeast Asian cuisine, traditional medicine, and religious rituals. Ghrita is also cited as the best substance for preparing the body for Ayurveda's internal detoxification (Panchakarma). It is widely used in medicinal formulations due to its unusual ability to assimilate the properties of herbs it is mixed with, without losing its own qualities.

Ghee is common in cuisines from the Indian subcontinent.Particularly the satwik type of food prepared in almost temples use ghee as a major ingredient for their culinary skills. Ghee is widely used in South Indian cuisine for tempering curries, in preparation of rice dishes and sweets. South Indians have a habit of adding ghee to their rice before eating it with pickles and curries. South Indians are one of the biggest consumers of ghee. Ghee is an ideal fat for deep frying because its smoke point (where its molecules begin to break down) is 250 °C (482 °F), which is well above typical cooking temperatures of around 200 °C (392 °F) and above that of most vegetable oils. Ayurveda considers pure ghee to be *sāttvik* or *sattva-guṇi* (in the "mode of goodness"), when used as

food. It is the main ingredient in some of the Ayurvedic medicines, and is included under *catuh mahā sneha* (the four main oils: *ghṛta, taila, vasā*, and *majjā*) along with sesame oil, muscle fat, and bone marrow. Though eight types of ghee are mentioned in Ayurvedic classics, ghee made of human breast milk and cow's ghee are favored. Ghee is also used in Ayurvedas for constipation and ulcers.To understand Ghee better we need to focus on it's mother-*Butter.*

History of Butter

Named for its bright yellow color, ghee is more than just butter. This clarified cooking fat was most likely used to fuel lamps and heal skin ailments, but over time found its way to the plate – and that's a very good thing. Ghee is, according to Hinduism, a true food of the gods. It's loaded with health benefits, dripping with culinary flavor, and the perfect fat for diabetics. Around a 1,000 year ago, butter was discovered by humans hauling milk from one place to another in skin bags around central Asia. This and then churned milk (cream) turned to butter. In India, the hot climate made it necessary to preserve the butter some way so someone heated it into Ghee.

Butter – A Universal Food?: Early humans ate what they could, where they could find it. Most of our ancestors started out as hunter gatherers, and passed through a pastoralist phase before finally settling down and practicing agriculture. The pastoralist phase was more important than you might realize. It diversified our dairy consumption to a great extent – foods like yogurt, cheese, and butter came out of this period. Butter production most likely began by accident. A shepherd, with a skin bag of goat, sheep, yak, cow, camel, or other milk, spent a little too much time letting that bag bang around in the heat before opening it for a drink. When the time came for a drink, the contents of the bag weren't milk anymore… they were butter. Around the world, butter has hundreds of names, and is enjoyed in the majority of cultures. It's a nearly universal food.

Modern Alternative Medicine

From the days of its initial discovery, butter has been used as a topical ointment it has many health qualities and is one of the healthiest of saturated fats, but ghee's benefits are better than butter's. The majority of clarified butters in the world remove milk fats and solids in the early stages of production. Ghee leaves them in, adding a nutty flavour to the final product, and there's one extra benefit that the

lactose and casein content is very little, since these components break down during the slow boiling that creates ghee. That makes it a great substitute for people with lactose or casein sensitivities.

Like all fats, if you overdo it, your health will suffer. For a healthy diet, it's a great pick, though. It has a higher smoke point than most cooking fats, making it a little healthier from the get-go. Rich in butyrate, it eases digestion and reduces inflammation in the body. One tablespoon is equal to 15% of your daily recommended intake of Vitamin A, and the conjugated linoleic acid (CLA) in ghee is thought to be a potent cancer fighter. There's a chance that CLA also helps insulin resistance, making this a smart choice for diabetics and prediabetics, too. A moisturizer, helps heal burns, and is great for dry hair or as a conditioning mask? Just remember, the majority of the benefits offered by ghee disappear if it's not made with milk from grass-fed cows.

Butter is an ancient food, and ghee is nearly as old. In many parts of the world where it is actively used in culinary and medicinal preparations, this clarified butter goes by the traditional Indian name. Its health benefits are quickly coming to light, and as we experiment with more and more ghee recipes, modern alternative and natural medicine is also reconnecting with this super fat.

The earliest butter would have been from sheep or goat's milk; cattle are not thought to have been domesticated for another thousand years. An ancient method of butter making, still used today in parts of Africa and the Near East, involves a goat skin half filled with milk, and inflated with air before being sealed. The skin is then hung with ropes on a tripod of sticks, and rocked until the movement leads to the formation of butter.

In the Mediterranean climate, unclarified butter spoils quickly— unlike cheese, it is not a practical method of preserving the nutrients of milk. The ancient Greeks and Romans seemed to have considered butter a food fit more for the northern barbarians. A play by the Greek comic poet Anaxandrides refers to Thracians as *boutyrophagoi*, butter-eaters. In his *Natural History*, Pliny the Elder calls butter "the most delicate of food among barbarous nations", and goes on to describe its medicinal properties. Later, the physician Galen also described butter as a medicinal agent only.

Historian and linguist Andrew Dalby says most references to butter in ancient Near Eastern texts should more correctly be translated as ghee. Ghee is mentioned in the Periplus of the Erythraean Sea as a typical trade article around the first century CE Arabian Sea, and Roman geographer Strabo describes it as a commodity of Arabia and Sudan.

God of Hindus KRISHNSA and his affection for butter

Middle Ages

In the cooler climates of northern Europe, people could store butter longer before it spoiled. Scandinavia has the oldest tradition in Europe of butter export trade, dating at least to the 12th century. After the fall of Rome and through much of the Middle Ages, butter was a common food across most of Europe—but had a low reputation, and so was consumed principally by peasants. Butter slowly became more accepted by the upper class, notably when the early 16th century Roman Catholic Church allowed its consumption during Lent. Bread and butter became common fare among the middle class, and the English, in particular, gained a reputation for their liberal use of melted butter as a sauce with meat and vegetables. In antiquity, butter was used for fuel in lamps as a substitute for oil. The *Butter Tower* of Rouen Cathedral was erected in the early 16th century when Archbishop Georges D'Amboise authorized the burning of butter instead of oil, which was scarce at the time, during Lent.

Across northern Europe, butter was sometimes treated in a manner unheard-of today: it was packed into barrels (firkins) and buried in peat bogs, perhaps for years. Such "bog butter" would develop a strong flavour as it aged, but remain edible, in large part because of the unique cool, airless, antiseptic and acidic environment of a peat bog. Firkins of such buried butter are a common archaeological find in Ireland; the National Museum of Ireland – Archaeology has some containing "a

greyish cheese-like substance, partially hardened, not much like butter, and quite free from putrefaction." The practice was most common in Ireland in the 11th–14th centuries; it ended entirely before the 19th century.

Industrialization

Like Ireland, France became well known for its butter, particularly in Normandy and Brittany. By the 1860s, butter had become so in demand in France that Emperor Napoleon III offered prize money for an inexpensive substitute to supplement France's inadequate butter supplies. A French chemist claimed the prize with the invention of margarine in 1869. The first margarine was beef tallow flavoured with milk and worked like butter; vegetable margarine followed after the development of hydrogenated oils around 1900.

Gustaf de Laval's centrifugal cream separator sped up the butter-making process.

Until the 19th century, the vast majority of butter was made by hand, on farms. The first butter factories appeared in the United States in the early 1860s, after the successful introduction of cheese factories a decade earlier. In the late 1870s, the centrifugal cream separator was introduced, marketed most successfully by Swedish engineer Carl Gustaf Patrik de Laval.This dramatically sped up the butter-making process by eliminating the slow step of letting cream naturally rise to the top of milk. Initially, whole milk was shipped to the butter factories, and the cream separation took place there. Soon, though, cream-separation technology became small and inexpensive enough to introduce an additional efficiency: the separation was accomplished on the farm, and the cream alone shipped to the factory. By 1900, more than half the butter produced in the United States was factory made; Europe followed suit shortly after. In 1920, Otto Hunziker authored *The Butter Industry, Prepared for Factory, School and Laboratory*, a well-known text in the industry that enjoyed at least

three editions (1920, 1927, and 1940). As part of the efforts of the American Dairy Science Association, Professor Hunziker and others published articles regarding: causes of tallowiness (an odour defect, distinct from rancidity, a taste defect); mottles (an aesthetic issue related to uneven colour); introduced salts;] the impact of creamery metals and liquids; and acidity measurement. These and other ADSA publications helped standardize practices internationally.

Butter also provided extra income to farm families. They used wood presses with carved decoration to press butter into pucks or small bricks to sell at nearby markets or general stores. The decoration identified the farm that produced the butter. This practice continued until production was mechanized and butter was produced in less decorative stick form. Today, butter presses remain in use for decorative purpose. There has been a declined in most western nations during the 20th century in consumption of butter, due to popularity of margarine, -less expensive and - healthier. In the United States, margarine consumption overtook butter during the 1950s, and it is still the case today that more margarine than butter is eaten in the U.S. and the EU.

Packaging-India

In India, butter has traditionally been made into small, rectangular blocks by means of a pair of wooden butter paddles. It is usually produced in 250 gram bars and 500 gram blocks that are individually wrapped in waxed or foiled paper, and sold. This practice is believed to have originated in The USA in 1907, when Swift and Company began packaging butter in this manner for mass distribution. Due to historical differences in butter printers (machines that cut and package butter), in the USA 4-ounce sticks are commonly produced in two different shapes: Butter for commercial and industrial use is packaged in plastic buckets, tubs, or drums, in quantities and units suited to the local market.

WORLD BUTTER PRODUCTION

Rank	Country	Production (1000 MT)
1	India	5,850
2	EU-27	2,360
3	United States	861
4	New Zealand	540
5	Russian Federation	275
6	Mexico	230
7	Canada	125
8	Belarus	118
9	Ukraine	103
10	Brazil	86
11	Australia	75
12	Japan	61
13	Argentina	44

Different varieties are found around the world. *Smen* is a spiced Moroccan clarified butter, buried in the ground and aged for months or years. A similar product is *maltash* of the Hunza Valley, where cow and yak butter can be buried for decades, and is used at events such as weddings. Yak butter is a specialty in Tibet; *tsampa*, barley flour mixed with yak butter, is a staple food. Butter tea is consumed in the Himalayan regions of Tibet, Bhutan, Nepal and India. It consists of tea served with intensely flavored—or "rancid"—yak butter and salt. In African and Asian developing nations, butter is traditionally made from sour milk rather than cream. It can take several hours of churning to produce workable butter grains from fermented milk.[40]

Storage and cooking

Normal butter softens to a spreadable consistency around 15 °C (60 °F), well above refrigerator temperatures. The "butter compartment" found in many refrigerators may be one of the warmer sections inside, but it still leaves butter quite hard. Until recently, many refrigerators sold in New Zealand featured a "butter conditioner", a compartment kept warmer than the rest of the refrigerator—but still cooler than room temperature—with a small heater.[41] Keeping butter tightly wrapped delays rancidity, which is hastened by exposure to light or air, and also helps prevent it from

picking up other odours. Wrapped butter has a shelf life of several months at refrigerator temperatures. Butter can also be frozen to further extend its storage life.
"French butter dishes" or "Acadian butter dishes" have a lid with a long interior lip, which sits in a container holding a small amount of water. Usually the dish holds just enough water to submerge the interior lip when the dish is closed. Butter is packed into the lid. The water acts as a seal to keep the butter fresh, and also keeps the butter from overheating in hot temperatures. This method lets butter sit on a countertop for several days without spoiling.

Once butter is softened, spices, herbs, or other flavouring agents can be mixed into it, producing what is called a *compound butter* or *composite butter* (sometimes also called *composed butter*). Compound butters can be used as spreads, or cooled, sliced, and placed onto hot food to melt into a sauce. Sweetened compound butters can be served with desserts; such hard sauces are often flavoured with spirits. When heated, butter quickly melts into a thin liquid. Melted butter plays an important role in the preparation of sauces, most obviously in French cuisine. *Beurre noisette* (hazelnut butter) and *Beurre noir* (black butter) are sauces of melted butter cooked until the milk solids and sugars have turned golden or dark brown; they are often finished with an addition of vinegar or lemon juice. Hollandaise and béarnaise sauces are emulsions of egg yolk and melted butter; they are in essence mayonnaises made with butter instead of oil. Hollandaise and béarnaise sauces are stabilized with the powerful emulsifiers in the egg yolks, but butter itself contains enough emulsifiers—mostly remnants of the fat globule membranes—to form a stable emulsion on its own. *Beurre blanc* (white butter) is made by whisking butter into reduced vinegar or wine, forming an emulsion with the texture of thick cream. *Beurre monté* (prepared butter) is melted but still emulsified butter; it lends its name to the practice of "mounting" a sauce with butter: whisking cold butter into any water-based sauce at the end of cooking, giving the sauce a thicker body and a glossy shine—as well as a buttery taste.
In Poland, the butter lamb (*Baranek wielkanocny*) is a traditional addition to the Easter Meal for many Polish Catholics. Butter is shaped into a lamb either by hand or in a lamb-shaped mould. Butter is also used to make edible decorations to garnish other dishes. Butter is used for sautéing and frying, although its milk solids brown and burn above 150 °C (250 °F)—a rather low temperature for most applications. The smoke point of butterfat is around 200 °C (400 °F), so clarified butter or ghee is better suited to frying. Ghee has always been a common frying medium in India, where many avoid other animal fats for cultural or religious reasons. Butter fills several roles in baking, where it is used

in a similar manner as other solid fats like lard, suet, or shortening, but has a flavour that may better complement sweet baked goods. Many cookie doughs and some cake batters are leavened, at least in part, by creaming butter and sugar together, which introduces air bubbles into the butter. The tiny bubbles locked within the butter expand in the heat of baking and aerate the cookie or cake. Some cookies like shortbread may have no other source of moisture but the water in the butter. Pastries like pie dough incorporate pieces of solid fat into the dough, which become flat layers of fat when the dough is rolled out. During baking, the fat melts away, leaving a flaky texture. Butter, because of its flavour, is a common choice for the fat in such a dough, but it can be more difficult to work with than shortening because of its low melting point. Pastry makers often chill all their ingredients and utensils while working with a butter dough.

As butter is essentially just the milk fat, it contains only traces of lactose, so moderate consumption of butter is not a problem for lactose intolerant people. People with milk allergies may still need to avoid butter, which contains enough of the allergy-causing proteins to cause reactions. Whole milk, butter and cream have high levels of saturated fat. Butter is a good source of Vitamin A.
Named for its bright yellow colour, ghee is more than just butter. This clarified cooking fat was most likely used to fuel lamps and heal skin ailments, but over time found its way to the plate – and that's a very good thing. Ghee is, according to Hinduism, a true food of the gods. It's loaded with health benefits, dripping with culinary flavour, and the perfect fat for diabetics. Around a 1,000 year ago, butter was discovered by humans hauling milk from one place to another in skin bags around central Asia. This and then churned milk (cream) turned to butter. In India, the hot climate made it necessary to preserve the butter some way so someone heated it into Ghee.

Butter – A Universal Food? Early humans ate what they could, where they could find it. Most of our ancestors started out as hunter gatherers, and passed through a pastoralist phase before finally settling down and practicing agriculture. The pastoralist phase was more important than you might realize. It diversified our dairy consumption to a great extent – foods like yogurt, cheese, and butter came out of this period. Butter production most likely began by accident. A shepherd, with a skin bag of goat, sheep, yak, cow, camel, or other milk, spent a little too much time letting that bag bang around in the heat before opening it for a drink. When the time came for a drink, the contents of the bag weren't

milk anymore… they were butter. Around the world, butter has hundreds of names, and is enjoyed in the majority of cultures. It's a nearly universal food.

Enter the Ghee

The Asian subcontinent has a long-standing love affair with butter. In some parts of the region, the average life expectancy stretches well above 100 years of age, and the people are quick to credit the butter they use. In the northeast corner of the Indian subcontinent, sometime near 1800-2000 BCE, the need to carry butter for distances – probably for trade – led to the creation of shelf-stable butter. Ghee. Ghee's creation took place in what is now the northeast corner of India, but its popularity bloomed somewhere else. Somewhere that milk would go rancid too quickly to use, and regular butter would be a useless puddle by midday. Southern India. The impact of this healthy and shelf-stable fat was so important that it soon found its way to a place you probably wouldn't expect.

This saturated fat gained a religious following.

Sacred Fat

In ancient India Ghee appears in Chapter 9 of the Bhagavad Gita, and in at least one of the hymns of Rig Veda from approximately 1500BCE. Dharma sutra law verses, a code that included religious and political requirements, ghee is mentioned as a key part of religious rituals.

Prajapati, the lord of creatures in Hindu mythology, created ghee when he rubbed his hands together to churn it. He poured the ghee into fire in order to create his offspring. As a result, many Hindus still re-enact this gesture as a means of recreating creation. The religious impact of ghee in India stretches beyond the spiritual and mythological references and into practice. The caste system of India is strict and Hindu foods are divided by class. No one can eat food that someone of a lower caste prepares unless it is a "superior" food. One way to make even the most "inferior" foods into superior ones is to cook them in ghee. As a result, cooking in ghee is a great way for Hindu restaurant owners to ensure that clientele of all castes eat at their establishments. And in Ayurvedic medicine, ghee is used in special preparations with herbs for healing.

Modern Alternative Medicine

From the days of its initial discovery, butter has been used as a topical ointment. It has many health qualities and is one of the healthiest of saturated fats, but ghee's benefits are better than butter's. The

majority of clarified butters in the world remove milk fats and solids in the early stages of production. Ghee leaves them in, adding a nutty flavour to the final product, and there's one extra benefit that the lactose and casein content is very little, since these components break down during the slow boiling that creates ghee. That makes it a great substitute for people with lactose or casein sensitivities.

Like all fats, if you overdo it, your health will suffer. For a healthy diet, it's a great pick, though. It has a higher smoke point than most cooking fats, making it a little healthier from the get-go. Rich in butyrate, it eases digestion and reduces inflammation in the body. One tablespoon is equal to 15% of your daily recommended intake of Vitamin A, and the conjugated linoleic acid (CLA) in ghee is thought to be a potent cancer fighter. There's a chance that CLA also helps insulin resistance, making this a smart choice for diabetics and prediabetics, too. A moisturizer, helps heal burns, and is great for dry hair or as a conditioning mask? Just remember, the majority of the benefits offered by ghee disappear if it's not made with milk from grass-fed cows.

Butter is an ancient food, and ghee is nearly as old. In many parts of the world where it is actively used in culinary and medicinal preparations, this clarified butter goes by the traditional Indian name. Its health benefits are quickly coming to light, and as we experiment with more and more ghee recipes, modern alternative and natural medicine is also reconnecting with this super fat.

2 Types of traditional Ghees: There are two types of traditional ghee. One, as mentioned above, where yogurt is churned to make butter, and subsequently converted to ghee. The other comes from clotted cream, or malai, skimmed from the top of boiled milk, which is then churned into butter and heated to produce ghee. The latter is a common practice in several Indian households and as I remember, is how my mother and grandmother made ghee. Both these techniques can be traced back to our pastoral ancestors. They learned that by churning yogurt in a to-and-fro motion for a long enough duration, at the right temperature, they could extract butter. This trickled down to tropical plains where a hotter climate necessitated the boiling of milk to keep it from spoiling, which eventually led to the daily collection of readily available clotted cream.

Elsewhere in the world, fresh cream is separated from raw milk using a crankshaft system that spins milk at high speeds, separating the heavier skimmed-milk and allowing the lighter cream to drip down. Old-fashioned European churners didn't subscribe to the aggressive to-and-fro churning principle; instead they adopted the gentle and continuous aeration of cream, which, as any baker will tell you, is how over-whisked fresh cream becomes butter. Butter is actually a water-in-oil emulsion

that typically is at least 80% fat, about 16-18% water, and 1-3% milk solids depending on the commercial brand of butter.

Salted butter has a longer shelf life than does unsalted butter.What this means, is that generally speaking, unsalted butter tends to be "fresher" than salted butter because it cannot stay on grocery store shelves for as long. In addition, the salt content of butter varies by brand, so it becomes harder to control the amount of salt that a baking recipe calls for. Since baking is an exact science, the lack of control can make it harder to manage the delicate balance of flavours that exist in many baked goods.

Melted butter: Melted or drawn butter is achieved by heating up butter so that it goes from solid into a liquid. The liquid form still retains the milk solids. This can be done in a sauce pan or a microwave, but care must be taken to not burn the butter. Melted butter should be done over low or medium heat, or else the milk solids will separate and burn the butter.

Creamed Butter: Creamed butter is a mixture of butter and sugar where the sugar acts to aerate or add air into the butter to achieve a fluffy consistency. Butter first is softened – often accomplished by leaving out in room temperature to have the butter to lose some of its firm structure and become "softened".

Butter replace Creamed Butter and Vice Versa in a Recipe? The answer to this depends on what baked good you are cooking and what texture you are looking to accomplish. In general, creamed butter will lead to cakier textures as it introduces more air to the baking process than melted butter. Melted butter in comparison will be denser, and often times recipes calling for this will introduce another leavening agent to be the one adding air to a baked good.

Melted butter is often used in recipes that call for gentle mixing such as quick breads, brownies, muffins, cupcakes, pancakes etc. These recipes usually have a leavening agent such as baking powder or baking soda as part of the recipe. Creamed butter is often used in cakes, cookies, and other foods that have fluffier textures. That's not to say that creamed butter or melted butter can't be replaced, just that the difference in texture and incorporation of air is something that needs to be taken account of in order to do so.

Clarified Butter: Clarified butter is purified butterfat, where the milk solids and the water have been removed. This is often done by heating the butter in a saucepan to precisely the point where water evaporates. The milk solids are then filtered in a strainer lined with a cheesecloth. Clarified butter is more concentrated in flavour as a result of removing the water. An advantage of clarified butter in baking is that it has a high smoke point, which means the temperature it can be heated up to before it burns.

Browned Butter: Browned butter is a result of heating butter and letting it caramelize. Unlike ghee and clarified butter, the milk solids will caramelize and be retained for cooking or baking. Browned butter introduces what most people define as a "nutty caramel flavour". Browned butter is a fairly potent flavour that can really elevate the flavours in a lot of baked goods. In comparison to butter, margarine has a higher water content and a lower fat content, which will greatly impact the flavour and texture of your baked goods. It is not recommended in baking because it can have a fairly sizable impact on your recipe.

Cocoa butter is not from cow's milk and is instead the vegetable fat from cocoa beans. It is typically used in chocolates, but not ideal for baking as it has a low melting point.

The key difference here in India is that we have always struggled to separate fat (or cream) from milk, whether by the laborious churning of yogurt or by tedious collection of small portions of malai. But this struggle has inadvertently led to a far superior flavour. In both cases, fermentation plays a necessary role in developing and nurturing these flavours of terroir(Earth) and releasing micronutrients that add depth and character to ghee.

Malai ghee has a gently fermented dairy flavour, resting on the sturdy notes of toffee, a result of the caramelisation of residual sugars in the malai. This nutty, brown-butter flavour is a joy to savour in tadkas. With yogurt ghee, the sugar content in butter is very low, and good yogurt ghee does not have these notes of caramelised sugar. With more sophisticated flavours brought about by secondary fermentation, yogurt ghee is a revelation yet to find its place in the spotlight.

Today's mass-produced store-bought ghee is another example of industrialised food. In order to control costs and minimize losses, large-scale dairies have adopted the European separation of fresh cream from milk, and now make ghee by directly heating this sugar-rich cream. With standardisation comes the predictability of flavour: a one-dimensional product that has been stripped bare of nuance.

The fermented dairy flavour is notably absent, but customers still enjoy it for the nutty notes of caramel that have come to be associated with ghar ka ghee.

Comparative properties of common cooking fats (per 100 g)

Type of fat	Total fat (g)	Saturated fat (g)	Mono-unsaturated fat (g)	Poly-unsaturated fat (g)	Smoke point
1. Sunflower oil	100	11	20	69	225 °C (437 °F)
2. Sunflower oil (high oleic)	100	12	84	4	
3. Soybean oil	100	16	23	58	257 °C (495 °F)
4. Canola oil	100	7	63	28	205 °C (401 °F)
5. Olive oil	100	14	73	11	190 °C (374 °F)[47]
6. Corn oil	100	15	30	55	230 °C (446 °F)
7. Peanut oil	100	17	46	32	225 °C (437 °F)
8. Rice bran oil	100	25	38	37	250 °C (482 °F)
9. Vegetable shortening (hydrogenated)	71	23	8	37	165 °C (329 °F)

Comparative properties of common cooking fats (per 100 g)

Type of fat	Total fat (g)	Saturated fat (g)	Mono-unsaturated fat (g)	Poly-unsaturated fat (g)	Smoke point
10. Lard	100	39	45	11	190 °C (374 °F)
11. Suet	94	52	32	3	200 °C (392 °F)
12. Butter	81	51	21	3	150 °C (302 °F)
13. Coconut oil	100	86	6	2	177 °C (351 °F)

Ghee or clarified butter is a dairy product used widely in Indian cuisine. With about 171 thousand metric tons produced in fiscal year 2018, it was consumed mostly in the northern region of the country. Ghee is not such a bad thing to consume after all, but the health conscious Indian consumer wants more. Enter organic ghee. This phrase basically means ghee churned out of milk derived from 'stress free' or 'happier' cows that are put on organic diet. Players in this niche category have seen huge surge in demand, with some of them clocking as much as 400 per cent growth in sales.

Off late, with rising awareness on different types of cholesterol and demand for ghee has seen an upsurge among urban consumers, especially cow ghee has been clocking a robust growth rate, almost double of that of buffalo ghee. Cow ghee is, however, just about 10 per cent of the Rs 10,000 crore Indian ghee market.

Niche players like Organic India, Vedic Cow and Holy Cow Foundation have tried to cater to a fast growing niche category here, organic cow ghee.

Lucknow-based Organic India has seen demand for its organic ghee grow manifold in the past four years since it launched. As Saurabh Tiwari, chief marketing officer of Organic India claims that the demand for organic ghee has grown by almost 400 per cent for them in the past four years, and this is when organic ghee costs at least 40-50 per cent more than conventional ghee.

What is organic ghee? It is ghee derived out of the milk from cows who are fed an organic diet. Some like Vedic Cow Products who run an online portal to sell indigenous items like khadi, food items like ghee, honey etc, claim that it is essential that the milk is sourced from 'stress-free' cows who are not only fed well but are also allowed to roam freely, feed their calves first. Nishant Khadria, the founder of Mumbai-based Vedic Cow Products said that the quality of the milk changes when cows are

stressed, as the hormones that go into the milk change dramatically. He now sources his milk from only four to five 'gaushalas' or cow farms around Maharashtra, Rajasthan and Uttarakhand. The milk is converted into ghee at the gaushala itself, so that there is no need to refrigerate and preserve the milk.

"We only source from cows of Indian breed because ayurveda talks of benefits of ghee from Indian cows. And in the two years that we have started, we have noticed that despite selling at a strong premium (Vedic Cow's ghee is priced at Rs 1300 per kg as against Rs 450-500 a kg for conventional ghee), we continue to grow at 30 per cent year on year in terms of volumes and new customer acquisition," Khadria explained.

His firm has also started exporting to customers in the US, where people are trying to incorporate organic ghee as a part of their everyday diet.

Organic India too is business worth Rs 5-6 crore from organic ghee alone. It was selling around 1,000 bottles per month around four years back, and now it does around 14,000 bottles a month. Tiwari is vocal about the pesticide contamination which gets into our milk, and in turn, all milk products. Therefore, Organic India has ensured that the land on which these cows graze are certified organic. "It takes around three to four years to convert a land into organic. We add neem, cow dung etc apart from stopping usage of chemical pesticides altogether," he explained. Organic India is currently working with over 2,000 marginal farmers who have around 2 acre of average landholding.

It has also tied up with modern trade outlets to boost sales, however, now the company feels that there is more demand than it can supply. "We see an immediate demand of around Rs 15-20 crore for organic ghee alone from Organic India," Tiwari said. The Rs 200 crore company gets around 65 per cent of its revenues from organic tulsi, which it also exports outside India.

Brand experts feel that with the rise of the health conscious, there is demand for organic food, and ghee as a category is no exception. *First Published: Sat, May 21 2016. 13:37 IST*. BUSINESS STANDARD

In India, ghee has been a symbol of purity and an offering to the gods—especially Agni, the Hindu god of fire—for more than 3000 years; references to ghee's sacred nature appear numerous times in the *Rig-Veda*, circa 1500–1200 BCE. The tale of the child Krishna stealing butter remains a popular children's story in India today. Since India's prehistory, ghee has been both a staple food and used for ceremonial purposes, such as fuelling holy lamps and funeral pyres. Traditionally, ghee (Sanskrit: गोघृत, go-ghṛta) was and is always made from bovine milk, as cows are considered sacred, and it is a sacred requirement in Vedic *yajña and homa* (fire rituals), through the medium of Agni (fire) to offer oblations to various deities.Fire rituals have been performed dating back over 5,000 years. They are thought to be auspicious for ceremonies such as marriage, funerals, etc. Ghee is also necessary in Vedic worship of divine deities, with *aarti* (offering of ghee lamp) called *diyā* or *dīpa* and for *Pañcāmṛta* (Panchamruta) where ghee along with mishri , honey, milk, and curd is used for bathing the deities on the appearance day of Krishna on Janmashtami, *Śiva* (Shiva) on *Mahā-śivarātrī* (Maha Shivaratri). There is a hymn to ghee.

"Ghrita is sweet in taste and cooling in energy, rejuvenating, good for the eyes and vision, kindles digestion, bestows lustre and beauty, enhances memory and stamina, increases intellect, promotes longevity, is an aphrodisiac and protects the body from various diseases." (Bhavaprakasha 6.18.1)

Indigenous (Desi) method of Ghee manufacture:

The International Dairy Federation (IDF) has recently drafted a standard for ghee whereby it is defined as a product exclusively obtained from milk, cream, or butter from various animal species, by processes which result in almost the total removal of moisture and solids-not-fat. It must consist of a mixture of higher melting point fats in liquid form. It should contain no more than .3% moisture. Milk fat (mostly glycerides) constitutes 99.5% of the total solids. This IDF standard is being examined for its final acceptance.is the most refined end product of milk. (When you make Ghee, you are concentrating the quality of the milk you started with. This includes, antibiotics, hormones (rGBH), chemical pesticides, etc. It is an age-old process and largely adopted in rural areas/villages and also at urban household levels because of simplicity in equipment and technique. This traditional method of making ghee contributes about 80% of the total ghee produced in the country. This method usually involves two routes:

(1) Lactic acid fermentation of raw or heated milk is followed by churning of curd into makkhan (butter)

(2) Separation of malai (clotted cream) from the boiled milk and its churning into butter. Dahi or buttermilk of previous day is used as starter culture for fermentation of milk. Churning of curd or malai is done with hand wooden churn. Now-a-days electrically operated butter churns are available and used by many housewives or makkhan producers.

Makkhan is stored at room temperature for days together and when sufficient quantity accumulated, it is converted into ghee. For this purpose, makkhan is heated in an earthen pot (now-a-days metal, particularly steel or aluminium containers are also used) on slow fire. The scum gathered on the top of melted butter is continuously removed with perforated ladle. The heating is discontinued on complete removal of scum and froth and getting clear fat (ghee). There are several limitations in this process which are mentioned here:

- The quality of ghee is highly inconsistent in terms of chemical and sensory quality.
- Method is incompatible to large-scale production.
- Recovery of fat is low.
- Acidity is high and hence keeping quality is low.
- Manufacture and storage of ghee is done in undesirable containers.
- Ghee residue being acidic in nature cannot be used.

The indigenous method is not adopted by organized dairies. Most of the ghee produced by this method is either consumed for household purpose or serves as a base material for the blending operations at ghee grading and packing centres functioning under Agricultural Marketing and Grading (AGMARK) scheme in India. To overcome the problems associated with desi method an improved indigenous method has been suggested which is as follows:

- Always pre-filter/strain milk before use.
- Give suitable heat treatment, preferably boiling the milk before making dahi.
- Cool milk to room temperature (22-30oC) and then add starter culture for dahi preparation. The setting of dahi should be done under controlled conditions. Incubate milk till dahi is set and desired acidity (0.80 per cent) is developed. It normally requires about 16-18 hrs. In winter and 8-10 hrs. in summer.
- Churn dahi by electrically driven beater or butter churn.
- Use cold water during churning in summer months to minimize the fat losses in buttermilk (lassi), thereby improving the fat recovery in ghee.
- Make ghee preferably from fresh makkhan or store makkhan in a refrigerator if it is to be converted into ghee after a long period. Don't store makkhan or ghee in earthenware or copper or iron containers.
- Heat makkhan (butter) at sufficiently high (more than 100oC) temperature for ghee making.
- Strain ghee properly so as to make it completely free from residue.

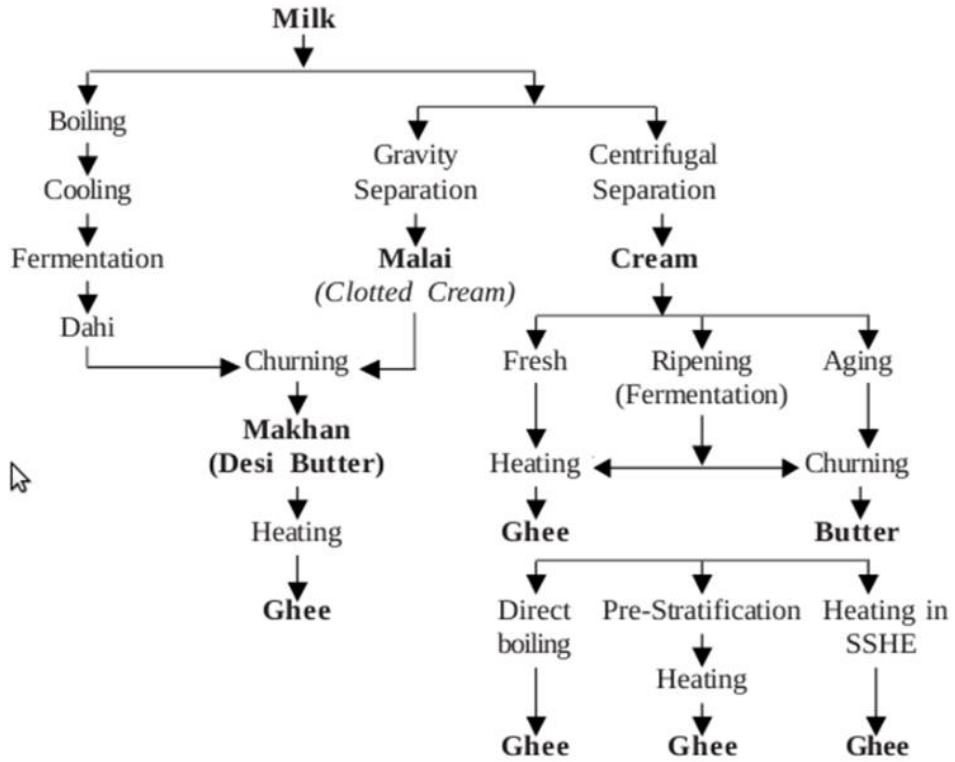
Vedic way of getting butter: On milking a cow gives whole milk. If this milk sits for a while, cream rises to the top. If it is skimmed off, and then churned the fat globules will begin to stick to each other and form butter. What is left over is buttermilk. In the west today, very little butter is churned the old fashioned way. Most modern dairies, even many "organic" ones, no longer churn their cream to make butter. In a typical dairy in America, the cream is now pushed (extruded) through a fine mesh screen in which the heavier and larger molecules of butter are held on one side of the screen while the smaller molecules of buttermilk pass on through. According to the Vedic way of making butter if made without churning- it lacks the quality of fire (Agni). Home-made Indian way of churning their cream with a hand churn, rolling it back and forth between their hands imparts a particular balancing quality to the Ghee – as opposed to the churning by a gear driven. There is one very important difference in the way Ghee was and is made in India. The Indians start out with milk from a cow, just like in the West but they do not let the cream rise to the top and skim it off as in the West. Instead, - they culture the milk with yogurt, allowing it to sit for 4-5 hours, just before it becomes completely soured. Then they churn the whole milk. [3]

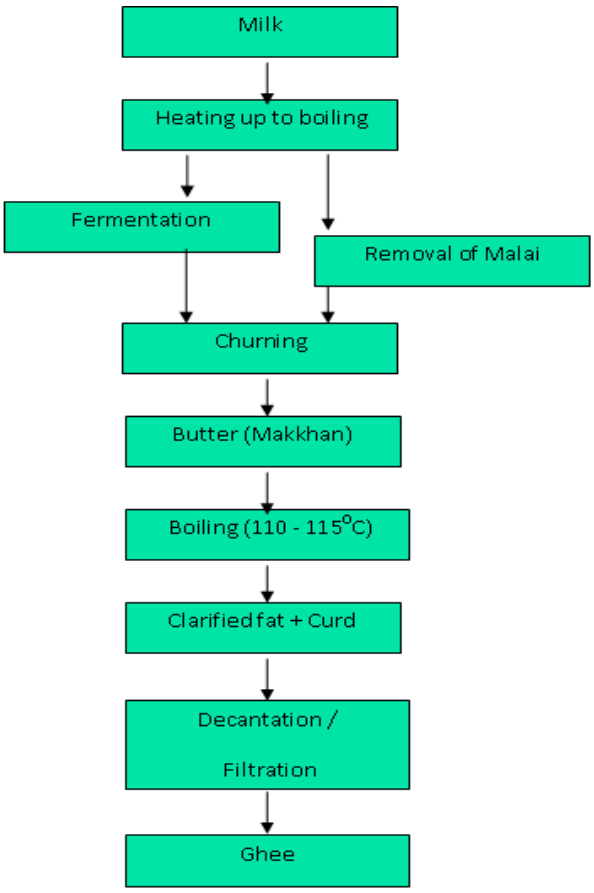
TABLE. Relative merits of different methods of making ghee.

Method	Adaptability	flavour & Texture	Keeping Quality	Vitamins	Economics production
Desi method	Rural Home	Max. Flavour Attractive body and texture	Poor	Absent or trace	No additional cost
Creamery butter method	Industrial	Flat Flavour Ripened cream, better flavor	Good	More than Desi	Costly equip.Labour
Direct Cream method	Industrial	Flat Flavour Ripened cream, better flavor	Excellent	Max.	Costly equip.Labour

Ghee: Its Chemistry, Processing and Technology, N. C. GANGULi and M. K. JAIN,National Dairy Research Institute, Karnal, India,Journal of Diary Science.Vol 56,No1, 1972.

From that point on, the process is more or less the same. This culturing with yogurt introduces another form of fire (agni) into the substance of refining the milk into butter and then Ghee.





The commercial milk, cream and butter method: Milk is homogenized and pasteurized or ultra-pasteurized (This is a process whereby milk is heated to a higher temperature than pasteurization for a shorter period of time. This kills and destroys various living substances/enzymes in the milk thus prolonging shelf life. Ultra pasteurized milk can keep un-refrigerated for over a month). The effect of this if we are to understand Ayurveda increases the Vata (air and other/destructive, catabolic, drying, rough) qualities in what was originally a very Kapha substance (earth and water, building, oily, tonifying, anabolic) - milk. Some of these processes, like homogenization, make the milk, and thus the cream and butter, indigestible. One of the things you can look for in milk and cream is the sticky quality (**picchila**), one of the gunas of Kapha. It will be lacking in processed milk products.

In the West manufacturers make their butter by extrusion. Furthermore, they homogenize and ultra-pasteurize their milk. Once obtained the butter is heated in a stainless steel or enamel pot, bringing it to a boil. It is said that it is most important to create and enjoy a beautiful and positive environment when you are making Ghee. This subtle recommendation is perfectly in line with cooking Ghee on an open fire - it makes a difference. Similarly, environment can affect Ghee quality. It is better to turn it

down to the lowest flame at which it will continue to boil. As it boils, moisture evaporates off it and it will begin to "clarify" - the butter will turn from cloudy yellowish liquid to a more golden colour. Whitish cloudy milk solids will rise to the top and sink to the bottom. After an hour and half to several hours, depending on the amount and the size of the pot and the amount of Ghee compared to the flame, your Ghee will be ready. The moment Ghee is "ready" is very critical. If you cook the Ghee too little, you will be left with moisture in the Ghee and it will lack the exquisite taste and qualities that it can develop, also, it will tend to spoil or sour. If you cook it too much, it will burn and impart a certain nutty flavour to the Ghee. This does not ruin the Ghee at all, but it is to be noticed, so that over time you can capture the "perfect" Ghee to be experienced between these two "extremes". After the Ghee is done top light crust of whitish milk solids is skimmed off. These and the heavier ones at the bottom of the pot are traditionally used to make sweets. Children in India love them and always plead with their Mothers to have the leftovers when Ghee is made.

Then, the golden, sweet-smelling liquid is poured through layered cheesecloth - to catch any last impurities into a bottle, leaving the slightly burned milk solids (caramelized lactose) on the bottom of the pot you cooked it in (Ghee has no lactose or milk sugars in it). Be sure to not close the glass jar into which you pour the hot Ghee until it comes to room temperature. The reason for this is that there should not be any moisture from condensation that may form on the inside of the jar. It is moisture that spoils Ghee, allowing a mold to grow and causing it to go bad. This is the reason why clean and dry spoons are to be used take it out of its container. It is also a reason not to refrigerate it. One, because it is not necessary and two, it causes condensation to form inside the jar as you take it in and out of the refrigerator.

Time and Season

It is best to make Ghee on the waxing fortnights of the moon as the moon represents the Mother and nurturing and all the best qualities of milk and butter are energized at this time. Regarding time and season, the quality of Ghee will change as the time of year and the diet of the cows change. Not all milk cows in the West are given green pastures to graze on. Even those, which are allowed to graze in the fields, often do not do so all year round. In winter, there are many days that the cows are not able to go out in the pastures and there is more hay and silage in their diet. This will change the quality of the milk, butter and Ghee. I have noticed that the more the cows graze in the fields on grass, the more yellow is the Ghee. This "yellow" is the result of more chlorophyll in the butter.The making

of Ghee is a very beautiful and peaceful experience. The sound of softly boiling butter, the pouring of the thick golden liquid into bottles ... this wonderful smell permeates the air.

Cows and Buffalos

In India, Ghee is made from both Cow and Buffalo milk. If we consider the qualities of both of these animals, we can see why the Ghee of Cows is to be preferred. If we look at the bodies of a Buffalo and a cow, the buffalo is more heavily muscled; it is a denser animal in its makeup. Cows have a more moderate make-up of fat. The Ghee of a Cow is in liquid form at body temperature. The Ghee of a Buffalo is still slightly solid. Buffalo will eat almost any food, even spoiled food, while Cows in their natural environment, will turn away from such fare. Buffalos are often quite dirty and smell more strongly than Cows. Cows tend to be clean and like little dirt on their bodies. Cows smell quite good as I have experienced, when I stopped to pet and smell them on the streets of India where they roam about, ubiquitously, slowly and peacefully. Finally there is the striking difference in temperament between a Cow and Buffalo. Cows are far gentler in nature. Buffalos are comparatively more stubborn and aggressive. Because of these qualities and more, Buffalo milk and Ghee are considered more dulling (tamasic) while Cow milk and Ghee are considered more pure and purifying (sattvic).

There is a growing use of Buffalo milk and ghee over Cow milk and Ghee, because the Buffalo give more milk. Furthermore, the Indian peasants seek the nourishment of Buffalo Ghee, which has a far higher fat content than cow Ghee. Even in Vrndavan, the home of Sri Krishna, where he himself was a cowherd, protector of the cows (Govinda) and the divine lover of the Gopis, cowherdesses, Buffalo Ghee is omnipresent in the marketplace. You can tell the difference because Buffalo Ghee is white and Cow ghee is yellow.

Ghee is the cornerstone of several cuisines in India. However, little is known about its regional variants.

1. Ghee from Spiti Valley of Himachal Pradesh. At 4,300 metres altitude, Demur in Spiti is one of the highest villages in the world. On the arid, leeward side of the Himalayas, water is a scarce resource and most of the foliage is reduced to shrubs and small trees. People depend entirely on domesticated animals for their survival. Dung from churrus — a local breed of cow-yak — is painstakingly collected by villagers every day of summer, despite the laborious task of walking up and down the terrace fields, as it is a necessary energy source to keep homes warm in winter. Butter and ghee form a most crucial food source.
2. Milk from churrus is collected every day and poured into a large wooden contraption with a capacity of about fifty litres, to be churned. Roughly once in ten days, the continuously fermenting milk is churned into butter. This butter has all sorts of complexity to it: from the lactic notes of buttermilk, to the more piquant notes of cheese (imagine the aroma of Parmigiano Reggiano), and even the elusive flavours of 2-Heptanone — a flavour compound produced in blue cheese. The ghee made from this butter has a delicious punch.
3. Flavours of the terroir: Just as bees are attracted to the first blossoms of the season, bovines follow fresh grass. The concept is simple — it takes roughly 30 kg of milk to produce 1 kg of ghee. The flavours of the terroir — the wild shrubs, the grasses and flowers — that animals have

fertilized and grazed upon, are heightened in this compression, giving the ghee its particular flavour. But let us go back to the beginning. With India's diverse microclimates and dairy breeds, numerous varieties of ghee can be produced. Imagine for a moment, the flavour of ghee from a single cow fed a very specific diet over six months.

The Ghee market comprises of Modern Trade (MT) /Institutional Sales /FMCG Product .Modern Trade involves handling sales through distributors to retail accounts like Big Bazaar, DMart, ABRL, Spencers etc. This also involves direct Cash and Carry accounts like Metro Cash & Carry, Walmart etc. and few independent self-service stores for allocated area. Marketing is done by negotiation and generation of Purchase Order's from local buying managers through team and servicing of PO's in coordination with supply chain for Stocks. Handling Trade Activation for MT Accounts for Merchandising Activities like new launches, Visibility and Promotions conducted at the account level.

The healthy growth of the market can be attributed to numerous forces. Population growth, rising disposable incomes, easy availability, and growing awareness about the benefits of ghee are some of the factors that are broadening the growth aspects of the market.

Manufacturing Processes: The main flavor components of ghee are carbonyls, free fatty acids, lactones, and alcohols. Along with the flavor of milk fat, the ripening of the butter and temperature at which it is clarified also affect the flavor. For example, ghee produced by the clarification of butter at 100 °C or less results in a mild flavor, whereas batches produced at 120 °C produce a strong flavor.

Ghee differs slightly in its production. The process of creating traditional clarified butter is complete once the water is evaporated and the fat (clarified butter) is separated from the milk solids. However, the production of ghee includes simmering the butter, which makes it nutty-tasting and aromatic. A traditional Ayurvedic recipe for ghee is to boil raw milk, let it cool to 110 °F (43 °C). After letting it sit covered at room temperature for around 12 hours, add a bit of dahi (yogurt) to it and let it sit overnight. This makes more yogurt. This is churned with water, to obtain cultured butter, which is used to simmer into ghee. There are 4 common methods through which ghee is prepared. Industrial preparation on the other hand by FMCG companies such as Patanjali Ayurved is done by using "white

butter", usually sourced from other dairies and contractors. In the cream butter method, cream is separated from milk and churned to produce butter. The butter then undergoes heat clarification.

1. **Milk butter**

   Sour raw milk is churned into butter. The butter is boiled in an open pan to allow the water to evaporate. The hot ghee is transferred and stored.

2. **Direct cream**

Separation of cream of 60 to 70% fat from milk by centrifugation process, fresh cream or cultured cream is heated to 114±2°C in a stainless steel, jacketed ghee kettle. This kettle is fitted with an agitator, steam control valve, pressure and temperature gauges. A movable hollow stainless tube centrally bored for emptying out the contents or alternatively provision can be made for tilting device on the ghee kettle to decant the product. Heating is discontinued as soon as the colour of the ghee residue turns to golden yellow or light brown. Usually, first plenty of effervescence accompanied by a crackling sound in the preliminary stages of boiling but both gradually subsides when the moisture content decreases. When almost all the moisture is evaporated, the temperature of the liquid medium suddenly spurts up and care has to be exercised at this stage to control the heating. The end point is indicated by the appearance of second effervescence, which is subtler than the first one accompanied by the browning of curd particles. At this stage the typical ghee flavour emanates and this indicates that the final stage in the preparation of ghee.

Advantages of this method are

1 No need for butter production prior to manufacturing of ghee.

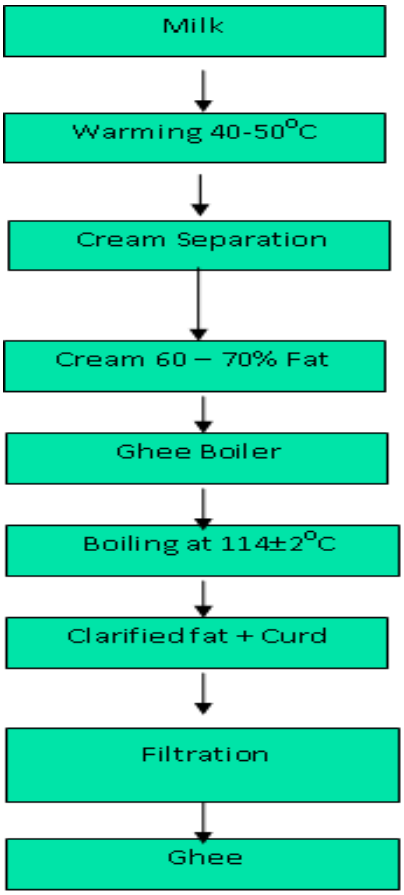
Limitations

1. Long heating time to remove the moisture.

2. High content of serum solids in the cream may also produce a highly caramelized flavour in the ghee.

3. 4 – 6% loss of butter fat in the ghee residue & during the handling operations.

4. So, 70 – 80% fat cream is recommended to minimize both fat loss and steam consumption



Creamery Butter Method This is the standard method adopted in most of the organized dairies. Unsalted or white butter is used as raw material. Butter mass or butter blocks are melted at 60°C to 80°C in butter melted. Molten butter is pumped into the ghee boiler where final heating will be done using steam as heating medium. Increase the steam pressure to raise the temperature. Scum which is forming on the top of the surface of the product is removed from time to time with the help of perforated ladle. Moment of disappearance of effervescence, appearance of finer air bubbles on the surface of the fat and browning of the curd particles indicates to stop heating. At this stage typical ghee aroma is produced. Final heating temperature is adjusted to about 114±2°C. To get the cooked flavour, heating beyond this temperature is also being in practice. Ghee is filtered via oil filter into the settling tank.

1. **Pre-stratification**

Butter is produced from aged cream of 38 to 40% fat using continuous butter making machine or batch churn. Butter is then transferred to butter melter, and melt at 80°C. This molten butter is kept undisturbed in a ghee kettle or boiler at a temperature of 80-85°C for 30 min. Here, in ghee kettle, stratification of mass takes place, product stratifies into 3 distinct layers. Denatured protein particles (curd particles) and impurities are collected on top layer and floats on surface. Middle layer consists of clear fat and bottom layer consists of buttermilk serum carrying 80% of moisture and 70% of solids-not-fat contained in butter.

The bottom layer is then carefully removed without disturbing the both top and middle layers. Middle layer, largely consists of fat is heated to 114±2°C along with top layer of floating curd particles and denatured protein. This step is necessary to develop characteristic ghee aroma. Milder flavour ghee can be produced, since most of the curd content is removed before final clarification temperature of ghee.

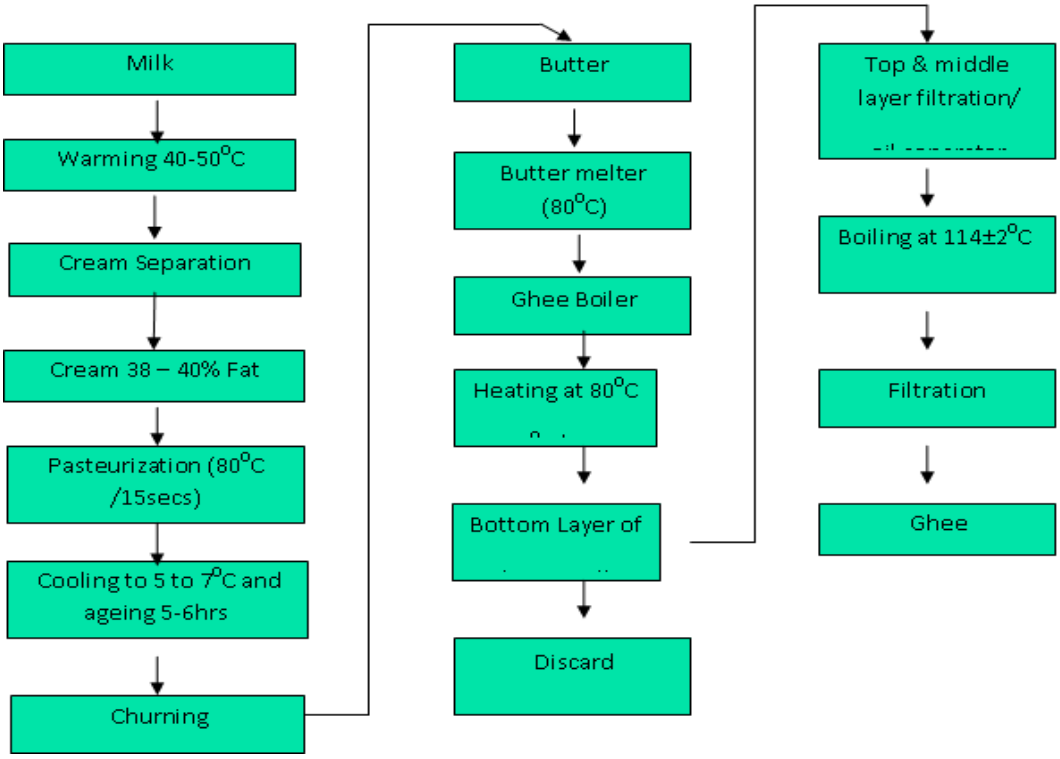
Advantages of pre-stratification method

* Removal of buttermilk (bottom layer) eliminates prolonged heating for evaporation of the moisture

* Formation of significantly low quantity ghee residue

* Low quantity of ghee absorbed into ghee residue so less fat loss along with ghee residue

* Production of ghee with lower FFA and acidity



Continuous Method: This method was developed to meet the requirement of high volume production and to overcome the limitation of batch method. Limitations of batch method are as follows:

* Requires high energy, due to low heat transfer co-efficient
* Cleaning and sanitation of equipments, not satisfactory
* Equipment and process unsuitable for large volume of production
* Floor becomes slippery due to ghee spillage
* Handling losses are more

Benefits;

* Better control on quality of the product
* only small hold-up of raw material in the plant at any time and hence no chance for whole batch getting spoiled
* Contamination by handlers can be eliminated
* CIP can be possible
* No foaming of the product during production

Butter is heated in a butter melted to molten state and then transfer into balance tank, and pumped further to scraped surface heat exchanger(SSHE), followed by flashing in vapour separator. And this

heating in SSHE 'Scraped Surface Heat Exchanger' and flashing are repeated in next two stages to reduce the moisture level. Ghee is then pass through centrifugal clarifier where residue will be removed. Clarified ghee is stored for filling and packing. The dynamic scraped surface heat exchangers incorporate an internal mechanism which periodically removes the product from the heat transfer wall. The product side is scraped by blades attached to a moving shaft or frame. The blades are made of a rigid plastic material to prevent damage to the scraped surface

Granulation and Cooling of Ghee

Granulation is important criterion of quality; higher temperature of clarification gives better grain size due to high phospholipids content. Completely melted ghee on cooling to prevailing Indian temperatures, can assume the form of large, coarse grains suspended discretely or in clusters in a liquid phase. The process of crystallization is initiated with the formation suitable nuclei. Rate of cooling strongly influences the rate nucleus formation. Stirring or agitation and seeding (at the rate of 1 – 3%) encourage the nucleus formation. For better granulation, ghee should be slowly cooled to 28°C in 2-3 hours' time and agitation is required during granulation to form smaller granules.

Causes of granulation: The partly granular form assumed by ghee is primarily due to certain content of glycerides of higher melting saturated fatty acids, especially palmitic & stearic. Thus buffalo milk ghee show predominant granulation than cow milk ghee.

Yield: The yield of ghee from cream or butter is influenced by fat content of raw material. Factors which influence the yield are listed below.

Following factors influence the yield of ghee,

1. Method of production: The fat recovery in indigenous method is lowest in range of 80-85% in creamery butter method it ranges from 88-92% and highest in direct cream method ranging from 90-95%.

2. The fat content of the raw material used: Higher the fat content higher will be the yield and vice versa.

3. Quality of milk or cream: If the acidity of milk or cream intended to use in ghee production is higher than fat losses in ghee residue will be higher, thus it reduces the yield.

4. Fat recovery from ghee residue: Scientific reports suggest to extract as much as fat from ghee residue by dissolving ghee residue in hot water followed by filtration and centrifugation. By this method, it is possible to extract the fat from ghee residue and that fat can be added back to cream or melted butter.

Packaging

Ghee may be packaged in airtight glass jars and stored without refrigeration.

Ghee is generally found to be packaged in airtight glass jars. They should be kept away from direct sunlight as sunlight can cause moisture to build inside the jar. Moisture can cause deterioration to the ghee's quality as well as reduce its shelf life. To prevent the acceleration of the oxidation process, they should be protected from anything that causes it, such as UV rays from the sunlight and fluorescent lights. If the jar is unopened, it does not need to be refrigerated as long as the previously mentioned conditions are met. Once opened, they can be stored in a kitchen cabinet for up to 3 months. Afterwards, it may be left in the refrigerator for up to a year. The refrigerator causes ghee to harden but if it is left at room temperature for a while, it will soften up again.

Composition

Ghee may be made of milk from various domesticated ungulates, such as cows and sheep. The composition of ghee varies depending on the animal whose milk has been used. The vitamin A content ranged from 315 to 375 international units per 100 grams. Palmitic acid and oleic acid were two of the main fatty acids found in both cow and sheep ghee. The saturated fatty acid profile was 53.9 to 66.8 percent, the unsaturated fatty acid profile was 22.8 to 38.0 and the other fatty acids was 3.5 to 10.4. Cholesterol amounts ranged from 252 to 284 mg/100 grams.

Market Summary:

The global ghee market grew at a CAGR of 3.9% during 2011-2018 reaching a volume of 5.9 Million Tons in 2018 and is expected to reach INR 4,653 Billion by 2024. Population growth, health benefits,

increasing disposable incomes and penetration in newer markets currently represent some of the key factors driving the demand of this product. The Indian market to be specific, is segmented on the basis of types into cow and buffalo ghee.

- The market is divided on the basis of the co-operative and private sector. At present, co-operatives represent the largest segment.
- The market has been categorized according to retail and institutional sales. Currently, retail sales account for the majority of the market share.
- On the basis of packaging, the market is segregated into 1kg, 0.5 Kg and 10-15 Kg. Amongst these, 1kg packaging is the most popular segment.
- The regional outlook of the market has been analysed across fifteen major states, namely, Karnataka, Maharashtra, Tamil Nadu, Delhi, Gujarat, Andhra Pradesh and Telangana, Uttar Pradesh, West Bengal, Kerala, Haryana, Punjab, Rajasthan, Madhya Pradesh, Bihar and Orissa. Amongst these, Uttar Pradesh represents the largest market followed by Rajasthan and Madhya Pradesh.
- The competitive landscape of the market has also been examined with some of the key players being Gujarat Co-operative Milk Marketing Federation Ltd., Mother Dairy Fruits and Vegetables Pt. Ltd., SMC Foods Limited, Bhole Baba Dairy Industries Ltd., Rajasthan Cooperative Dairy Federation Ltd (RCDF) and Parag Milk Foods Ltd.

Preservation: In India, preservation of milk and milk products is primarily achieved by heat induced desiccation. Ghee is obtained by clarification of milk fat at high temperature. Ghee is almost anhydrous milk fat and there is no similar product in other countries. It is by far the most ubiquitous indigenous milk product and is prominent in the hierarchy of Indian dietary. Being a rich source of energy, fat soluble vitamins and essential fatty acids, and due to long shelf life at room temperature (20 to 40C), 8070 of ghee produced is used for culinary purposes. The remaining 2070 is used for confectionery, including sma/l amounts consumed on auspicious occasions like religious ceremonies (22). Since buffalo milk constitutes more than 5570 of the total milk production in India and because of its higher fat content (6-770), ghee is manufactured mostly from buffalo milk. Due to lack of carotenoids in buffalo milk, ghee prepared from milk is white unlike cow ghee which has a golden yellow color. Be- cause of its pleasing flavour and aroma, ghee has always had a supreme status as an indigenous product in India.

Physicochemical Characteristics: Chemically, ghee is a complex lipid of glycerides (usually mixed), free fatty acids, phospholipids, sterols, sterol esters, fat soluble vitamins, carbonyls, hydrocarbons, carotenoids (only in ghee derived from cow milk), small amounts of charred casein and traces of cal cium, phosphorus, iron, etc. It contains not more than .370 moisture. Glycerides constitute about 9870 of the total material. Of the remaining constituents of about 270, sterols (mostly cholesterol) occur to the extent of about .5~. Ghee has a melting range of 28 to 44 C. Its butyl refractometer reading is from 40 to 45 at 40 C. The saponification number is not less than 220. Ghee is not highly unsaturated, as is evident from its iodine number of from 26 to 38. The Reichert-Meissl number (RM) of cow ghee varies from 26 to 29 whereas goat ghee is slightly less. Sheep and buffalo ghee on the other hand, have higher RM numbers of about 32. In general, ghee is required to have a RM number of not less than 28. It is, however, of interest that ghee from milk of animals fed cotton seeds has much lower RM numbers of about 20. Polenske number for cow ghee is higher (2 to 3) than buffalo ghee (1 to 1.5). No significant seasonal variations have, however, been recorded for their fat con- scants. The fatty acid profile of glycerides of ghee is very complex and still not completely elucidated. Layer formation is typical in ghee if stored above 20 C.

Preparation: Ghee making in India was and is mostly a home industry; particularly in villages where an estimated 60% of India's population lives. According to the 2011[2] census of India, 68.84% of Indians (around 833.1 million people) lived in 640,867 different villages. The size of these villages varied considerably. 236,004 Indian villages have a population of fewer than 500, while 3,976 villages have a population of 10,000+. Substantial amounts of Ghee comes from villages where it is usually prepared by the desk method. Recently, industry has manufactured improved ghee of more uniform quality. However, it still constitutes only a small fraction of the total annual production (450,000 metric tons) in India.

As mentioned earlier, ghee is prepared by four methods, namely, desi, creamery butter, and direct cream and pre-stratification methods. The essential steps involved in the preparation of ghee by these methods are outlined in Figures 1 to 4 (6, 15). Basically, the high heat applied to butter or cream removes moisture. Both are usually clarified at 110 to 120 C. However, in southern India clarification is at 120 to 140 C. The desi method consists of churning curdled whole milk (dahi) with an indigenous corrugated wooden beater, separating the butter, and clarifying it into ghee by direct open

pan heating. Earthenware vessels are used to boil milk and ferment it with a typical culture to convert it to dahi which in turn is churned to separate the butter. The creame~3r butter and direct cream methods are more suitable for commercial operations because less fat is lost. Direct cream method is reportedly most economical for preparing ghee and the product has better keeping quality . In the pre-stratification method, advantages such as economy in fuel consumption and production of ghee with low acidity and comparatively

settled portion, However, this method has not been adopted by industry. Desi method accounts for more than 97% of ghee manufactured. However, with industrial interest, the creamery butter and direct cream methods are increasing. The continuous ghee making equipment which is more sanitary was fabricated at the National Dairy Research Institute at Karnal. [4] consisting of a three-stage pressurized, swept surface separator.

The physicochemical characteristics of ghee are determined by:

1. type of animal feed
2. milk, or cream produced by the cow
3. dahi or butter
4. methods of preparation
5. temperature of clarification
6. storage conditions

The principal measurements of ghee quality are: peroxide value, acidity, and flavor.

Peroxide value and acidity. The quality of ghee on storage has been measured by acid and peroxide values. However, peroxide value varies considerably at the organoleptic threshold of rancidity. Though the thiobarbituric acid value (TBA value) is a more reliable.

Index of oxidative rancidity of ghee. TBA value of buffalo ghee was always higher than that of cow ghee.

Flavor. The most important factor controlling the intensity of flavor in ghee is the temperature of clarification. Ghee prepared at 120C or above has an intense flavor which is usually referred to as

cooked or burnt. In contrast, ghee prepared at around 110 G has a somewhat mild flavor, often referred to as curdy. The desi method generally produces ghee with the most desirable flavor.

The acidity of the cream or butter affects the flavor of ghee. Sweet cream-butter yields ghee with a fiat flavor whereas cream or butter having an acidity of o .15 to o.25% (lactic acid) as in ripened cream-butter, produces ghee with a more acceptable flavor.

However, the rate of deterioration in the market quality of ghee is least in ghee from unripened cream-butter and most in that prepared from ripened cream-butter. The flavor of stored ghee is influenced by the method of preparation and by temperature of clarification. In ghee made at 110 C, the original flavor is maintained for several months, but once deterioration begins, market quality is lost quicker than in ghee prepared at the higher temperatures of clarification. Flavor in ghee is retained longer when butter contains 1% NaCI. There is a general similarity in the gross patterns of volatile carbonyls isolated from differently produced ghee. Of the 11 earbonyls in most of the ghee produced, six have been tentatively identified as propanone, butanone- 2, pentanone-2, heptanone-2, octanone-2 and nonanone-2. Small but significant differences in the quality and quantity of volatile carbonyls in different types of ghee have been reported.

The use **of ripened cream butter** in the preparation of ghee improves the flavor, but the impact on the pattern of carbonylic compounds in ghee appears to be less marked. About 95% of the carbonyls in ghee are non-volatile. Cow ghee contains more volatile carbonyls. The total carbonyls of buffalo ghee is higher than that of cow ghee irrespective of the method of preparation and temperature of clarification.

The ketoglycerides constitute 50 to 60% of the total carbonyls in ghee, buffalo ghee (4.4 /~motes/g) having a higher proportion than cow ghee (2.4 /~moles/g). Oct-2-enal and dec-2-enal are the main alk- 2-enals in the volatile as well as monocarbonyls in ghee. The patterns of alkanals frem cow and buffalo ghee are similar and consist of ethanal, pentanal, hexanal, heptanal, octanal, nonanal, decanal, undecana] and dodecanal.

Changes on Storage Ghee undergoes physio-chemical changes, dependent primarily on the temperature of storage. Crystallization occurs with the formation of solid, semi-solid and liquid

layers. Ghee (cow and buffalo) kept either in a metal or glass container at 20 C or below, solidifies uniformly with fine crystal (3). Above 20 C and below 30 C, solidification is a loose structure. The liquid portion had a significantly higher RM number than the granular solid or hard flaky portion of the same ghee. A similar trend in the iodine number in these layers also occurs. It is preferable to store ghee below 20 C to avoid layer formation. Ghee stored at high temperature is also susceptible to oxidative deterioration, rancidity, and off flavor. Due to inadequate storage facilities in India, much ghee loses its market acceptability. Shelf life of ghee is also dependent on the method of preparation. The keeping quality of desi ghee is better than that of direct cream or creamery butter ghee. It has been claimed that milk phospholipids in ghee improves its shelf life. Ghee having more residue, which is a source of phospholipids, has a longer storage life.

Earlier, **packaging of ghee** was permitted ordinarily in 17, 4, 2 and i kg tinned cans (1). Excepting 17 kg cans, others must contain the net weight of ghee, e.g. 4, 2, or 1 kg. Permission is also given to pack ghee in 1 kg and half kg return- able glass bottles. Special permission of the Agricultural Marketing (Agmark) Adviser to the Government of India is necessary for pack- ing in any other size package. Most ghee is marketed in 4-gallon tin con- tainers. Cans are filled to brim with no air space to improve storage quality. Anti- oxidants like butyl hydroxyl anisole (BttA) are permitted to prolong shelf life.

In a Nutshell: Ghee vs. butter

Because ghee and butter both derive from cow's milk, their nutritional profiles and fat content are very similar.However, because ghee does not contain the same levels of dairy proteins as butter, it may be better for people who do not tolerate dairy products well.

Benefits and risks of ghee

Various research studies have looked at the possible benefits and risks of including ghee in a person's diet. These include:

*a. Heart disease.*According to research from 2010Trusted Source, ghee contains almost 50 percent saturated fat, which has led to concerns that ghee might increase the risk of coronary artery disease (CAD) in India.However, a 2018 study looking at 200 people in north India suggests that the fat and cholesterol in the blood was healthier in the people who ate more ghee and less mustard oil as

sources of fat in their diets. Results included lower LDL or bad cholesterol levels and higher HDL or good cholesterol levels.This study only compared results between ghee and mustard oil and not butter. Some forms of mustard oil are banned for consumption in the United States, Canada, and Europe because they contain erucic acid.

b.Lower levels of milk sugars and proteins

Because ghee has had many of its dairy proteins removed, it contains much lower levels of dairy proteins, such as casein, and lactose than regular butter.A person who is sensitive or intolerant to lactose and casein may find that it is beneficial to use ghee as a substitute for butter.

c.Contains butyrate

Ghee contains a fatty acid called butyrate acid, which plays an essential role in digestive health. It may also have anti-inflammatory effects.However, as butyrate is produced by bacterial fermentation of fiber in the colon, a person does not need to consume saturated fat to obtain this.According to the United States Department of Agriculture (USDA), real butter does not contain any trans fats. However, it does contain high levels of saturated fat, which can contribute to high blood cholesterol levels and heart disease if not eaten in moderation.The American Heart Association recommends that a person should get no more than 5 to 6 percent of their total daily calories from saturated fat, which is about 13 grams per day.However, fats are essential for a healthful diet. A person should limit their intake of saturated fats and increase their intake of monounsaturated and polyunsaturated fats, which are healthful fats.

Good sources of healthful fats include fish, nuts, seeds, and olives.

Conclusion: Ghee is another form of butter, and the nutritional profile and fat content of the two are similar. However, ghee may be better for people who are sensitive to lactose and casein because it contains less of both. While ghee and butter should be limited, a person can occasionally include both foods in a varied and balanced diet.

Nutrition / Diet

1. "The milk of cows is considered to possess the essence or sap of all plants and Ghee is the essence of milk... When we consider Ghee we are in the company of superlatives. In

India, Ghee has been so highly regarded for so many things, for so long, that one is slightly embarrassed to enter into this crowded river of praise.

2. The ingestion of Ghee is like offering the finest of fuels into the fires of digestion (Agni). In accord with this, Ghee builds the aura, makes all the organs soft, builds up the internal juices of the body (Rasa) which are destroyed by aging and increases the most refined element of digestion (Shukra or Ojas) the underlying basis of all immunity and the "essence of all bodily tissues".
3. Maya Tiwari- humanitarian, world peace leader and author. Also called "Mother Maya," an international teacher of Ayurveda, a health activist and the founder of the Wise Earth School of Ayurveda calls- Ghee the "single most "ojas" producing food on earth."
4. Ghee is known to increase intelligence (Dhi) refine the intellect (Buddhi) and improve the memory (Smrti).
5. Although Ghee kindles or increases the digestive fire (Agni) on which all nutrition depends, it does so without aggravating Pitta - the elemental functioning of fire within the body. In fact, Ghee cools the body, essential in much of today's world in which everything is overheating.
6. Ghee causes secretions and liquification in the dhatus - bodily tissues - that dissolve wastes allowing the functional intelligences of the body (doshas) to carry away toxins (Ama) (also known as aam). The ingestion of Ghee is used in Panchakarma specifically to first penetrate into and then dissolve ama in the dhatus, allowing the wastes to be then carried to the intestinal tract and then expelled.
7. It is traditionally considered, that the older Ghee is, the better its healing qualities. 100-year-old Ghee is highly valued in India and fetches a very high price. Such Ghee was often kept in Temples in large vats and families often pass on aged Ghee to their next generation to be used as medicine.
8. **Qualities of Ghee**

I. Ghee is known as a substance that gives longevity… This is because it has opposite qualities (heavy, slow, oily, liquid, dense, soft), and thus pacifying effects, to the light, dry and rough qualities of Vata dosha. It is the increase of the qualities of Vata that are synonymous with aging.

II. Ghee, in a very sure and steady way, slows the aging process by balancing the living one.

III. Ghee has the quality of snigda, oiliness, and unctuousness. It is smooth, lubricated and nurturing. Ghee is thought to make the voice soft and melodious.

IV. Ghee is Guru, heavy. It increases the qualities of Kapha and decreases Pittaand Vata, which are both light.

V. Ghee has the quality of Mrudu, softness. Ayurvedic panchakarma treatments use Ghee as oil used on eyes. In Netra Basti, a small dam is built around the eyes and filled with warm Ghee. Then, you open your eyes to its soothing softness. It seems after that treatment, that you see the world though a soft diaphanous curtain of love and loveliness.

9. **Healing Properties of Ghee**

In ancient India, wells full of Ghee were especially for those who suffered wounds. When a surgeon cuts open a body, he only does so knowing that the body will be able to heal itself. The surgeon cannot do this. Ghee is known for the quality of Ropana - healing, and its effectiveness in facilitating recovery from wounds. In Ayurveda, when a person has a chronic peptic ulceror gastritis, Ghee is used to heal that ulcer inside the intestinal tract.

a. Ghee works wondrously on bedsores for the elderly or debilitated. It can be applied for broken bones and bruises. It is highly effective for all sorts of skin rashes. It is also used on burns of both fire and chemicals.
b. Those with obesity should be very frugal in their use of Ghee and those with high cholesterol should not take Ghee at all.
c. Ghee increases the overall strength, luster and beauty of the sarira – the body. Let us look at a variety of ways:
d. Used on the skin, Ghee softens and strengthens, protects and nourishes. Up until the last generation in India, there used to be men who gave Ghee massages on the street. It was always the preferred substance for the skin, but since it was more expensive than oil it has come to be used only for internal purposes. For generations, Indians have used Ghee for cooking and as an added measure on top of their food and as a medicine.

e. In India, medicinal ghee is passed on from one generation to the next. It was used for old and young, for new babies (Mothers in India will massage their children with Ghee) and for those in the last days of their life. I massaged my Father's body with it before he died - He loved it. Sometimes, when he could not sleep, I rubbed it on his feet and temples and it soothed his agitation. It is considered it one of the best substances for self-massage (Abhyanga).

10. Many Uses of Ghee

1. For Body Massage-Abhyanga. Apply ghee all over the body, rubbing into head, chest, limbs, joints and orifices. This will bypass the digestive system and allow the qualities of Ghee to penetrate directly into the deeper tissues. It is said that 60% of what is placed on the skin is absorbed into the body. We literally "eat" what we put on our skin. Western science has discovered that massaging the skin creates endorphins or peptides, which enhance the body's immune system. Peptides are thought to be the vehicle that the mind and body use to communicate with each other, a literal chemistry of emotion. According to the Charak Samhita, regular Abhyanga slows the aging process.
2. Ghee is used in Purvakarma (early Panchakarma) where a small amount of Ghee is taken first thing in the morning by the practitioner to oleate the internal organs and "dissolve" the ama or toxic wastes in the tissues, allowing them to be carried to the digestive tract for elimination.
3. Ghee is used as a carrier or "yogavahi" for herbs and bhasmas because of its supreme penetrating qualities and thus ability to carry these substances deep into the dhatus or tissues. One or two teaspoons first thing in the morning followed immediately with hot water will promptly produce a bowel movement. It will also warm the body quickly. Two spoonfuls of Ghee in warm (non-homogenized) milk before bedtime is soothing to the nerves and lubricates the intestines and facilitates a bowel movement in the morning.
4. Ghee is excellent for cooking and sautéing or stir-frying. Ghee has one of the highest flash points of all oils and is very difficult to burn. In India, it is said that food is incomplete without the use of Ghee.
5. Ghee is excellent for a gargle (gandush) to improve the health of the teeth and gums.
6. Ghee can be used as a bath oil. Take two tablespoons of Ghee and mix with several drops of an essential oil of your choice.
7. Ghee is excellent for scrapes and both chemical and heat or fire burns.

8. Ghee can be used in the eyes for tiredness or fatigue.
9. Ghee is an exquisite facial moisturizer.
10. In India it is said that if a few drops of ghee are placed in the nostrils then nosebleed can be checked. If this is done twice in a day, then headache can be relieved.

On ghee, the Indian superfood

MORE-IN

METROPLUS **Prabalika M. Borah** prabalika.m@thehindu.co.in

The desi favourite has made a comeback on dinner plates of gourmands and health nuts alike

Another *desi* ghee recipe? Whether you're Paleo, Keto or simply chugging back Bulletproof coffee every morning, if you lurk around the Wellness web, you will inevitably stumble upon multiple fitness coaches gushing about the benefits of ghee. And a plethora of voices, from New York to Nairobi, asking for the recipe.

"Ghee is pure butterfat and is also called butter oil, because it is made after clarifying butter," explains Sangeeta Khanna, a food writer, patiently explaining the procedure. "It comes from milk fat. And can be of two types: uncultured ghee made by skimming all fat from whole milk, or the more common cultured ghee that is made in most Indian homes. For this, the cream is collected over a period of time and cultured with a little yoghurt. It is whipped into butter, which is then heated and made into ghee."

If you prefer to buy your ghee, Amazon alone lists about 300 options, starting from ₹75 to a 15-litre tin of Shree Radhey Certified A2 Gir Cow Ghee for ₹14,300. The variety is fascinating: ghee made from forest cows, indigenous cows and buffaloes. You can source your ghee from Uthukuli, famous for its milk, or from a *gaushala*. Of course, much of the small-batch ghee is grass-fed, hand-churned and artisan. But that's not all. Vrindavan milk even has a version that is hand-churned, made on a full moon night on a cow dung fire following a traditional "*vilona bilona* method (alternate direction churning)".

The rest of the world is following suit. American supermarkets focus on ghee made from the milk of grass-fed cows (as opposed to cows raised on grain-based feeds with soy and corn, which may contain GMOs). LA-based artisanal food brand Fourth & Heart, which specialises in ghee, offers what they call "Himalayan Pink Salt Grass-Fed Ghee Butter... Pasture Raised, Non-GMO, Lactose Free," in addition to Madagascar Vanilla Ghee, Californian Garlic Ghee and even — hold your breath — a Chocti Chocolate Passionfruit Ghee Cacao Spread.

Closer home, "Serve it hot with a spoonful of ghee" is how many Indian recipes conclude, conjuring up that familiar flavour and aroma. Once associated with the decadence of *ladoos*, *halwa* and *puran poli*, today, thanks to a slew of young nutritionists and increasingly media-savvy Ayurvedic spas, it's become India's favourite health food.

Blame game

And if there is anyone who still blames ghee for their weight, take a look at Kareena Kapoor Khan, who's proclaimed her weight loss secret: dal, rice and ghee.

"The properties of ghee are constant, provided one is consuming the right kind. Grandmoms routinely recommend it for children and they would not have done so had it been harmful," says Chef Kunal Kapoor. He talks about how ghee is one of the earliest cooking mediums, dating back thousands of years. Neutral oils are the resultant of what man discovered once he began to cultivate crops. "When cooked in ghee, both meat and vegetables taste better," he says, cautioning that the superfood can also be counterproductive if consumed indiscriminately. He adds, "Ghee isn't the culprit, it is our lifestyle and the quantities we consume that are a problem. Any superfood can go against us, if we do not lead an active life."

Lifestyle matters

Celebrity dietician and author, Rujuta Diwekar, has brought joy to many by giving ghee a superfood tag. In her book *Indian Super Foods*, Rujuta says, "The reason why there are such combos as *dal-chawal-ghee, roti-shakkar-ghee, puran-poli ghee, modak-ghee* etc in our culture is that ghee reduces the glycaemic index of these meals. The magic of ghee isn't just that it's the world's most high-functioning fat. It's also that it's a wonderful partner to other foods, complementing them to work better and harder for us."

Promoted by influencers like her, ghee now has great market potential. However, as brands proliferate, consumers need to be able to identify pure ghee from the inevitable, cheap adulterated versions also flooding the market.

"Pure ghee doesn't have an overpowering smell or flavour. Neither is it neutral in taste. This remarkable anti-ageing food, when adulterated with hydrogenated or animal fat, becomes a dangerous substance," cautions Ayurveda practitioner, Sharad Kulkarni. He adds that besides several beneficial properties, pure ghee comes with a unique advantage: "Ghee is *samskara anuvartana*, which means it retains its own goodness along with the health benefits of whatever it is cooked with," he explains. He adds that, according to Ayurveda, the food can improve your skin, memory and strength. It helps you detox and is even a centuries-old aphrodisiac."

R E F E R E N C E S

1.Bulletin D Le Ecole Francaise D Extreme' Orient,90-91,2003-2004

2.Devdutt-Patnaik-https://devdutt.com/articles/food-is-truth-what-the-hindu-gods-are-given-to-eat-and-why/)

3. N. C. GANGULi and M. K. JAIN National Dairy Research Institute, Karnal, India, July 1, 1972.

4. Office of the Registrar General & Census Commissioner, India, Ministry of Home Affairs, Government of India, http://censusindia.gov.in/Census_And_You/area_and_population.aspx

5.. Ramamurthy, M. K. and K. M. Narayanan. 1971. Fatty acid composition of buffalo and cow milk fats by gas-liquid chromatography (GLC). Milchwissenschaft,

CHAPTER 22

HUMAN-RESOURCES in HOUSING & CONSTRUCTION SECTOR

"But a few understand that building is a great symbol we live in our minds, and existence is the attempt to bring that life into physical reality, to state it in gesture and form. For the man who understands this, a house he owns is a statement of his life."

----Howard Roark, in Ayn Rand's FOUNTAINHEAD.

ABSTRACT

As an increasingly large portion of today's business economy comprises of service industries—businesses in which the main product is not an item sold in a store but rather is a set of actions performed for a client by the business's employees. As the service sector grew, so did the growth of the human resources (HR) industry proportionally. Resulting in the evolution of the traditional HR role of hiring and training workers, managing a company's payroll, and dealing with labor issues to now being charged with a broader, more conceptual, and strategic set of responsibilities that may include setting up job classifications and employee benefits systems or working with top management to develop plans to optimize use of company employees. Even an international human resources department can be found in some organizations having workers working in foreign countries.

Introduction: With the population set to rise to 9.7 billion by 2050 and 2 out of every 3 people set to live in cities there will continue to be a constant strain on the Real Estate sector. Whether you are in office, retail or residential real estate there will be massive market disruption.HR will need to ensure that it has the best talent maximize this disruption. The function of the human resources industry is to produce competent personnel and to keep employees productive. More than 800,000 people work in human resources and related fields today. Human resources is the department or division of a business, corporation, or organization that manages all aspects related to its personnel, including recruiting employees, training and career development, overseeing compensation packages, managing benefits plans, and other duties that serve to maximize a company's business and its employees' satisfaction with their jobs. As an increasingly large portion of today's business economy comprises of service industries—businesses in which the main product is not an item sold in a store but rather is a set of actions performed for a client by the business's employees. As the service sector grew, so did the growth of the human resources (HR) industry proportionally. Resulting in the evolution of the traditional HR role of hiring and training workers, managing a company's payroll, and dealing with labor issues to now being charged with a broader, more conceptual, and strategic set of responsibilities that may include setting up job classifications and employee benefits systems or working with top management to develop plans to optimize use of company employees. Even an international human resources department can be found in some organizations having workers working in foreign countries**.** As a result the RERDA came into being.

The Real Estate (Regulation and Development) Act, 2016 is an Act of the Parliament of India which seeks to protect home-buyers as well as help boost investments in the real estate industry. The Act establishes Real Estate Regulatory Authority (RERA) in each state for regulation of the real estate sector and also acts as an adjudicating body for speedy dispute resolution. The Act came into force on 1 May 2016. Prior to this Act the real estate sector, although is the second largest employment generating sector, had been burdened with hitches like large unsold inventories, high property rates and regulatory glitches. These were the major hurdle in the smooth functioning of the Indian real estate industry. The government's aim of building 100 smart cities and 'Housing For All' by 2022 were seen as lending a helping hand in easing the relocation burden on tier-I cities, thus accommodating the mounting quantum of fluctuating population with suitable amenities. Robust

infrastructure framework and sound development are also positive steps that go hand in hand in boosting the economy.The Act has special rules governing employees. For example in Maharashtra State- The Maharashtra Real Estate Regulatory Authority, Officers and Employees (Appointment and Service Conditions) Rules, 2016.

RERA Act Rules:

The Real Estate (Regulation and Development) Act, 2016 under Section 84 envisions that within a period of six months from its commencement date, State Governments will set the rules to carry out the provisions associated with the Act.

- On 31 October 2016, the centre, through HUPA (Housing & Urban Poverty Alleviation) Ministry, released the general rules of the Real Estate (Regulation and Development) Act, 2016.
- All these rules are applicable to the Union Territories like Chandigarh, Lakshadweep, Daman & Diu, Dadra & Nagar Haveli and Andaman & Nicobar Islands.

Some Points Under Real Estate Regulation and Development (RERA)

- **Security:** Under the RERA act, a minimum of 70% of the buyers' and investors' money will be kept in a separate account. This money will then be allotted to the builders only for construction and land related costs. Developers and builders cannot ask for more than 10% of the property's cost as an advance payment before the sale agreement is signed.
- **Transparency:** Builders are supposed to submit the original documents for all projects they undertake. Builders are not supposed to make any changes to the plans without the consent of the buyer.
- **Fairness:** RERA has now instructed developers to sell properties based on carpet area and not super built up area. In the event that the project has been delayed, buyers are entitled to get back the entire money invested or they can choose to be invested and receive monthly investment on their money.
- **Quality:** The builder must rectify any issue faced by the buyer within 5 years of purchase. This issue must be rectified within 30 days of the complaint.
- **Authorisation:** A regulator cannot advertise, sell, build, invest, or book a plot without registering with the regulator. After registration, all the advertisement for investments should bear a unique project wise registration number provided by RERA.

Salient Features

RERA was established to enhance accountability and transparency with respect to housing transactions and real estate. Here are the salient features of this Act:

- Establishment of Real Estate Regulatory Authority in every Indian state. This authority will monitor as well as adjudicate and arbitrate any disputes with respect to real estate projects in the concerned state.
- Establishment of a fast-track mechanism for settlement of disputes. This will be done via an appellate tribunal and dedicated adjudicating officers.
- All real estate projects must be registered with RERA. Moreover, the authority will have jurisdiction over such projects. They can also refuse the registration of a particular project if guidelines have not been adhered to.
- A project's registration can be cancelled if RERA receives any complaints that are found to be true after an inquiry has been made.
- A property cannot be sold if it is not registered with RERA.
- All promoters need to upload details of the project to the RERA website. These details include the types of apartments or plots, registration information, list of approvals taken and those remaining, the layout plan, sanction plan, and the status of the project.
- A promoter's application will be approved or rejected within 30 days. If you do not receive any information regarding this, you can assume that your application has been approved.
- If a promoter wishes to take an application fee or an advance payment from a buyer for a plot, apartment, or building, it cannot be more than 10% of the cost. Additionally, an advance payment or the application fee can be taken only once the promoter enters into a written agreement with the buyer regarding the sale of the property and this sale has been registered.
- All promoters will have to obtain insurance on the title of the building, the land, and the construction of each project.
- 70% of the amount collected from the buyers for a project needs to be deposited in a separate account. This account, ideally, should cover the cost of construction and of the land. It can only be withdrawn after the promoter receives certification from an architect, a chartered accountant, and an engineer.
- As a promoter, if you wish to transfer or assign a majority of your rights and liabilities in a real estate project to a third party, you will have to get prior written consent from two-thirds

of the allottees (not including the promoter). Additionally, you will need the written approval of RERA.

- If there is any default from the side of the promoter or the buyer, both will be liable to pay an equal rate of interest.
- If the promoter causes any losses to the buyer due to other people laying claim to property (defective title of land) which is under construction or has been constructed, the promoter will have to compensate the buyer. There is no limitation provided by any law currently with respect to the compensation amount.
- If a person has any problems regarding violation of the provisions or rules of this Act by a promoter, buyer, or an agent, they can file a complaint with RERA.
- While an enquiry is taking place, RERA can stop an agent, promoter, or buyer from continuing any activity against which a complaint has been raised.
- If any of RERA's decisions regarding a complaint is not satisfactory, the aggrieved party can submit an appeal before the Appellate Tribunal.
- If the promoter fails to follow RERA's orders, they will have to pay a penalty. This amount could be up to 5% of the evaluated cost of the property.
- If the Appellate Tribunal's orders are not complied with, a penalty will have to be paid. This can either be imprisonment for up to 3 years or a fine (up to 10% of the approximate cost of the project), or both.
- If a company commits an offence under this ACT, any person who was in charge of the business at the time of the offence being committed and the company will be held guilty and will be punished.
- No civil court will have any jurisdiction with respect to any matter that comes under RERA or the Appellate Tribunal's jurisdiction. As such, no court can grant an injunction with regards to any action taken by RERA or the Tribunal.

Benefits of RERA

RERA has a number of benefits for the buyer, the promoter, and the real estate agent. These include:

- **Standardisation of carpet area:** Before RERA the manner by which a builder calculated the price of a project wasn't defined. However, with RERA there is now a standard formula that is used to calculate carpet area. This way, promoters cannot provide inflated carpet areas to increase prices.

- **Reducing the risk of insolvency of the builder:** Most promoters and developers tend to have multiple projects being developed at the same time. Earlier, developers were allowed to move funds raised from one project to that of another. This is not possible with RERA since 70% of the funds raised need to be deposited in a separate bank account. These funds can be withdrawn only after certification by an engineer, a chartered accountant, and an architect.
- **Advance payment:** As per the rules, a builder cannot take more than 10% of the cost of the project from the buyer as advance or application fees. This saves the buyer from having to source funds fast and having to pay a large amount.
- **Rights to the buyer in case of any defects:** Within 5 years of possession, if there is any structural defects or problems in quality, the builder has to rectify these damages within 30 days at no cost to the buyer.
- **Interest to be paid in case of default:** Prior to RERA, if the promoter delayed possession of the property, the interest paid to the buyer was much lower than if the buyer delayed payments to the promoter. This has changed with RERA and both parties have to pay the same amount of interest.
- **Buyer's rights in case of false promises:** If there is a mismatch in terms of what was promised by the builder and what has been delivered, the buyer is entitled to a full refund of the amount that was paid as advance. At times, the builder may have to provide interest on the amount as well.
- **If defect in title:** If at the time of possession, the buyer discovers that there is a defect in the title of the property, the buyer can claim compensation from the promotor. There is no limit to this amount.
- **Right to information:** The buyer has complete right to information about the project. This includes plans related to layout, execution, and completion status.
- **Grievance Redressal:** If the buyer, the promoter, or the agent has any complaints with respect to the project, they can file a complaint with RERA. If they aren't pleased with RERA's decision, a complaint can also be filed with the Appellate Tribunal.

Impact of RERA Act:

After the Real Estate (Regulation and Development) Act, 2016 enforcement, registration of sale deed of a project unit cannot be done in the office of the sub-registrar without obtaining Occupancy Certificates or Completion Certificates. At present, unit registrations are taking place without

checking. It is occurring without obtaining Occupancy Certificates or Completion Certificates. No one is bothered about the legal consequences. The Department of Stamps & Registrations know about the RERA Act implications but they have not taken necessary steps to stop the unlawful sale deed registrations of such properties. Below are the few impacts:

- Fewer project will be launched as the promoters and builders will spend time to understand the impact of the Real Estate (Regulation and Development) Act, 2016. However, the honest promoters / builders / developers will benefit from this scenario as they will face lesser competition.
- Dishonest builders will disappear as they will fail to sustain in the market after the RERA Act is implemented.
- The 32 sections that have been added to the Real Estate (Regulation and Development) Act, 2016 will encourage a financial discipline in this sector.
- After the Act implementation, the developers will have to follow several formalities if they wish to make certain changes to the project after its commencement. A short-term chaos might break out in the real estate industry but in the long run, it will boost the confidence of the customers and they will invest more.

How RERA will impact Human Relations

Between 2000 and 2013, the Indian real estate sector attracted $40,399 million as foreign direct investment. It is expected to attract FDI of $180 billion by 2020. The sector grew at a CAGR of 9.42 per cent between 2003-04 and 2012-13. Capital investments in the sector are anticipated to rise from $651 billion in 2012-13 to $1181 billion in 2019-20. With further stream lining and transparency infused in to the functioning of the sector, it will positively attract fund flows, giving a much needed relief to the sector. India will need around 76.5 million strong work force in its booming building, construction and real estate sector. This sector will have the maximum incremental human resource requirement. The construction sector is the largest contributor to central exchequer and second largest employer in the country. It creates more than appx. 45 million jobs either directly or indirectly among various classes of individuals in the country. So the imminent need is to expand the reach of training providers, set up models and institutes with the capability to scale. There are many schemes launched by the government, National Skilled development mission to cater to this growing demand of skilled labour.

"Develop people through business.": The development of human resources, and nourishment of a corporate culture where pursuit of human resource development in a medium- and long-term perspective, and where each individual plans their own growth and improves themselves is now possible.Real estate traditionally has always had the perception of being a sector where 'land & buildings' was the language required and 'people skills' were of no great relevance. But, now, even big Real estate players are soon beginning to understand the importance of effective 'client servicing', enhanced 'team productivity' and professional 'managerial skills'. All of this are people skills revolving around the most important asset of any organization. 'PEOPLE'.

The effectiveness of an HR department can be gauged by the fact how it contributes to the organization as a channel of Help, as an OD interventionist and as a Controller.There was a time when one considered HR to be just a support function, because it did not contribute to the bottom line. However, with the boom in the economy and growth of the knowledge economy, HR has taken on a new role. As the focus moves from traditional brick and mortar organizations to more people oriented business like IT-ITeS, media etc.HR has become significant in nature and magnitude of its role in an organization. The competitive advantage of organizations has moved from machines and production to the expertise and creativity of its people, HR has a large role to play in attracting, motivating and finally retaining these very people.

In spite of this so called increases in power, one of the biggest fears that HR faces today, according to experts is that of striking a balance between the employer and the employee. Experts say that HR seems to be facing the brunt of the employer and the employees as it still does not seem to have the authority to take a stand regarding issues dealing with the organization. This trend is typically seen in sectors like Real-estate in India, which is still highly promoter driven.HR will only find success in dealing with these issues if they are given the freedom to incorporate the necessary changes through an HR perspective. I personally believe that comprehending an organization right from its culture, ethos, policies, practices, values, is more important, to find a right candidate, rather than just rely on a well drafted Job description. With immense opportunities, organizations are chasing very limited resources especially in terms of talent availability, spiralling compensation and benefit costs. The challenge for HR is therefore huge in the Real estate sector and spread across various sectors

including talent management i.e. talent acquisition, development and retention, building organizational capability, HR effectiveness measurement and organizational effectiveness.

So the question here arises is that does HR have a say in this or all they do is bring in random people with a few years of experience and place them in front of a line manager? While everyone complains that HR does not really care about what kind of people are bought in, experts have a different point of view. The feel that HR needs time to find the people with the right skills sets to complement not just the job but also the organization. Following are four ways that hosting the right experiences, in the right places, can help organizations deliver across multiple goals:

1. ***Human-oriented workplaces help your organization stand out from the corporate crowd.*** From the inside, out, an inviting workplace affords a highly visible way of differentiating your business from the competition. This can help nurture employee sense of belonging as well as shape external public perception.
2. ***A star-worthy workplace can appeal to star talent.*** Real Estate titans as well as smaller giants haven't been investing in amenities for laughs—they know that by investing in facilities where employee happiness is a clear organizational value, they are also investing in attracting world-class talent, and in turn, world-class productivity.
3. ***Future-friendly facilities can help drive PR and marketing.*** Forward-thinking organizations are leveraging real estate and HR strategies to market the value of their business through both the physical space and the people who inhabit it.
4. ***A positive environment feeds human experience*.** Engagement, empowerment and fulfillment may be banner words for HR teams, but they're also achievable goals for CRE teams. When the workplace moves people to push themselves to fulfil their personal greatness, more collective successes will follow.

These types of benefits are best achieved when real estate and human resource teams work seamlessly together to achieve shared goals.

After all, acting alone, CRE teams could have trouble garnering budgetary approval for an amenity-rich facility, which could be seen as a simple line item on a balance sheet when it could actually offer so much more business value from an HR perspective. On the other side of the hall, an HR team tasked with boosting staff engagement could have difficulty with the practicalities in a workplace that doesn't account for HR values.

Acting together, however, HR leaders could help make the case stronger for the higher calibre location, and CRE expertise could help create environments where engagement and collaboration comes naturally.

In the coming years, trends like integrated structures - mixed-use buildings that will comprise commercial, shared accommodations, mass housing and residential space and co-working space, and affordable housing will definitely be trending the real estate market. Good Human Resources and with a strong concrete base is surely going to be on top priority of all Real estate, building construction, project management. The future of work lies in breaking down walls (figuratively)

****

Pre-Publication Reviews

The book is an easy read, well researched and provide some very valuable insights that can be used in certain situations. The book oscillates between being a historical case study (Story telling format) of Design and Management and the author has been able to manage this switch back and forth quite well, without it becoming jarring and interrupting the flow of reading. The language used is fairly simple and tried to avoid jargons as far as possible, thereby making it easy to read.

What I loved about the book:

Some of the chapters that the author picked were very fresh and even those that were pretty well researched and they are able to find at least a few new insights which meant that I actually read the entire chapter study and not just skim through.

What has changed as a result of reading this book:

My concept of what disruption is has changed due to a single insight from the book and I quote –
"Disruption doesn't create growth. Growth creates disruption".

Ann Järvinen

Head Librarian

STOCKHOLM UNIVERSITY

SWEDEN

Disruptions proved disastrous for some companies like the Swiss Travel giant KUONI. As the successive cycles of the digital revolution work their way through the global economy, many (if not most) industry incumbents will be blown toward the same catastrophe. They will have to become faster and more responsive in order to avoid Kuoni's fate.

This book then talks about Disruption in Architecture and Human Resources also bands up with a set of essays on various topics all authored by the knowledgable writers and printed earlier as research Papers. One of these two Karan is aficionado in guiding new start ups and the other Dr Uday who has had an illustrious career in Human Resource Management in India and several countries was the labor law advisor to the Country of Seychelles.

Mikko Martikainen

Sargent- Police in Tampere, FINLAND

About the Authors

Dr. Uday Dokras

The author has worked for 30 years in the human resources arena in India and abroad. He was Group Vice -President of MZI Group in New Delhi and has anchored Human Relations in Go Air and Hotel Holiday Inn. He was General Manager-Health Human Resources at the Lata Mangeshkar Hospital and visiting Faculty at the Central Institute of Business Management and Research, Nagpur. Currently Consultant – Adminisgtration & Human Resources for the GOREWADA ZOO project- largest Zoo in Asia.

He has studied in Nagpur, India where he obtained degrees of Bachelor of Science, Bachelor of Arts (Managerial Economics) and Bachelor of Laws. He has done his Graduate Studies in labour laws from Canada at the Queen's University, Kingston and Doctorate from Stockholm University, Sweden. Apart from that he has done a Management Training Program in Singapore and a MBA from USA.

A scholar of the Swedish Institute, he has been an Edvard Cassel Awardee. In 1984 he was involved with the Comparative Labour Law Project of the University of California, Los Angeles, U.S.A. He was also visiting lecturer there. He has been invited by the President of Seychelles to do a study of the efficacy of the labour laws of Seychelles.

Author of a book on a Swedish human resource law, his brief life sketch is part of the English study text book of 7 th Class Students in Sweden -"Studying English. SPOTLIGHT 7"- and 8 th Class students in Iceland - "SPOTLIGHT 8- Lausnir."

Books Authored:

1. Act on Co-determination at Work-an Efficacy Study, Almqvist & Wiksell International, Stockholm,SWEDEN 1990
2. Health Human Resource Management, 2016
3. Theme Park Human Resource Engineering, Sewa Institute of Management, New Delhi 2017
4. Project Human Resource Management, Indo Swedish Author's Collective, Stockholm & Nagpur, 2018
5. Creativity & Architecture co-authored with daughter Srishti Dokras, 2019
6. WIN DIET to be launched in February 2020 by a nutrition Company in North India
7. Disruption, Management & Design, 2020

REVIEWS Of Dr Dokras' Books

The author's earlier book-

MBL- The Act on Codetermination at Work-an Efficacy Study,Published by Almqvist & Wiksell International, Stockholm. 1990

The author writes well and in a graceful fashion that is easy to comprehend considering the tremendous task he has undertaken and the complexity of the subject matter.

Late Dr.Stig Edlund (review in Juridiskt Tidskrift, 1 990) Professor Emeritus, Faculty of law. Stockholm University, SWEDEN

*****

Outstanding contribution to the unique Swedish legislation that defines management-employee tradeoffs. Must Read. Highly recommended./books. google. co. in

****

Part of the collection of Soren Oman, www.sorenoman.se

****

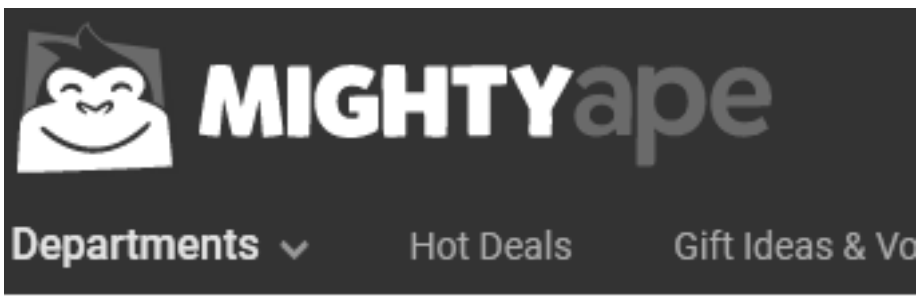
Part of the Collection of the Royal National Library of Sweden, Harvard University, Stanford University,the University of Neuchatel and The Swiss Institute of comparative Law, Lausanne, Switzerl and The European Library (The Conference of European National Librarians - CENL of 46 countries) etc

Act on Co-Determination at Work-An Efficacy Study, Almqvist & Wiksell International, Sweden

"Superb. Worth reading"- 5 stars"

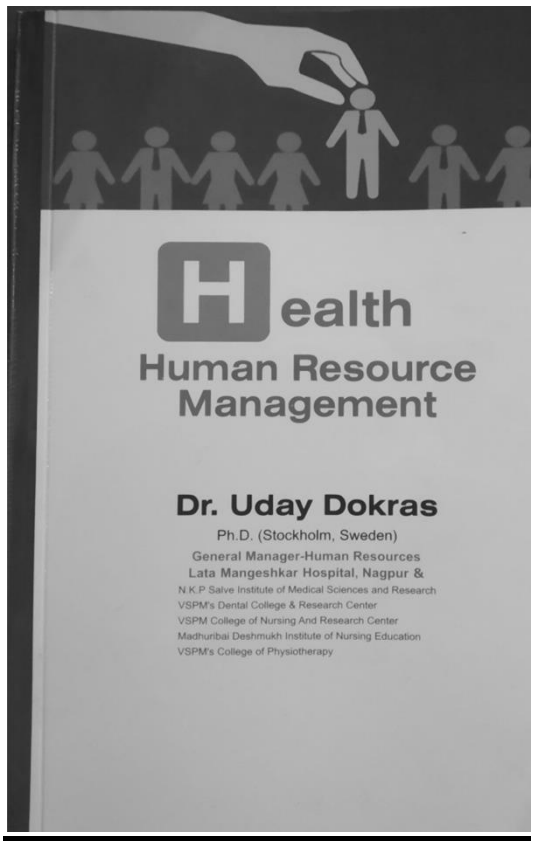
Review by Dr. Shantanu Joshi, JNU on 5th February, 2013

This work is an empirical examination of a statute and has been done for the first time in an comprehensive manner. What is striking isn the juxtapositioning of the factual material gathering the efficacy of the MBL with translations of the labour and supreme Court decisions that has bee flawlessly woven to produce a work that throws considerable light on this unique Swedish statute that has been under the microscope of an curious world. Readable and outstanding in its academic nuances.



Referred by

1. Company Law Reform in OECD Countries- A Comparative Outlook of Current ,Trends, OECD--Organisation for Economic Co-operation and Developmnent, Paris. France. 2000
2. Sweden: Joint Councils under Strong Unionism, Goran Brulin, professor of industrial relations at the School of Business of Stockholm University & research associate of the Swedish Institute of Work Life Research, Stockholm Published by National bureau of Economic Research, Sweden
3. Works Councils: Consultation, Representation, and Cooperation in Industrial Relations, edited by Joel Rogers, Wolfgang Streeck, University of Chicago,Press, 1995
4. Codetermination in Sweden: myth and reality, K Levinson - Economic and
5. Industrial Democracy, 2000 .Sweden
6. Working for McDonald's in Europe: the unequal struggle, T Royle - books,google. com. 2004
7. Employee representation and pay in Austria, Germany, and Sweden, M Muller-International studies of management & organization, 1 999 - Taylor & Francis, U .S.A.
8. Diedeutsche Mitbestimmung im internationalen Vergleich, KThelen, L Turner - Mitbestimmung in Deutschland. Tradition, 1 999 - books.google.com West Germany
9. Svedska druzba, sindikati in delavska participacija, M Nikolic-Teorija in praksa,1 999 - dk.fdv.uni-lj.si Slovenia
10. Fackets nya roll Fran forhandling till partssamverkan i lokalt utvecklingsarbet, Tommy Nilsson, Arbetsmarknad & Arbetsliv, arg 3, nr 3, hosten,1997, Sweden


Health
Human Resource Management
Dr. Uday Dokras
Ph.D. (Stockholm, Sweden)
General Manager-Human Resources
Lata Mangeshkar Hospital, Nagpur &
N.K.P Salve Institute of Medical Sciences and Research
VSPM's Dental College & Research Center
VSPM College of Nursing And Research Center
Madhuribai Deshmukh Institute of Nursing Education
VSPM's College of Physiotherapy

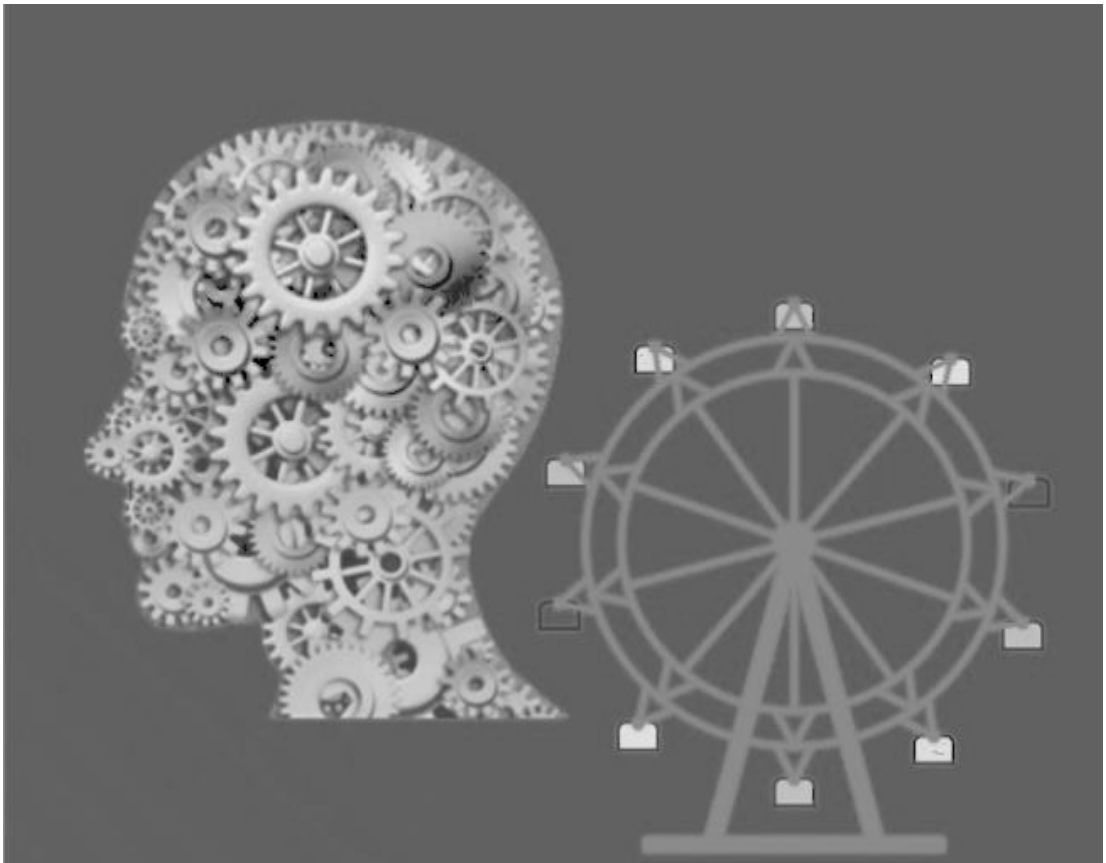
REVIEW of Health Human Resource management

I am glad for this contribution to health human resource management by Dr Uday Dokras. As a medical practitioner and Head of administration of a large hospital, I see the need for a constructive approach that can be given to the human resource department of hospitals to follow and restructure/arrange/symmeticalize the workers. This is just that book. Amazing. Stimulating and the right thing at ther right time.

Dr Alpana Chimurkar https://archive.org/details/UDAYDOKRAS_GMAIL_HHR_201609/page/n9

REVIEW of Theme Park Human Resource Enginering co-authored with Ms. Mansse Bhandari

Excellent contribution to the rare Theme Park research sources
Joginder Singh Uberoi, J.S. Uberoi & Co.



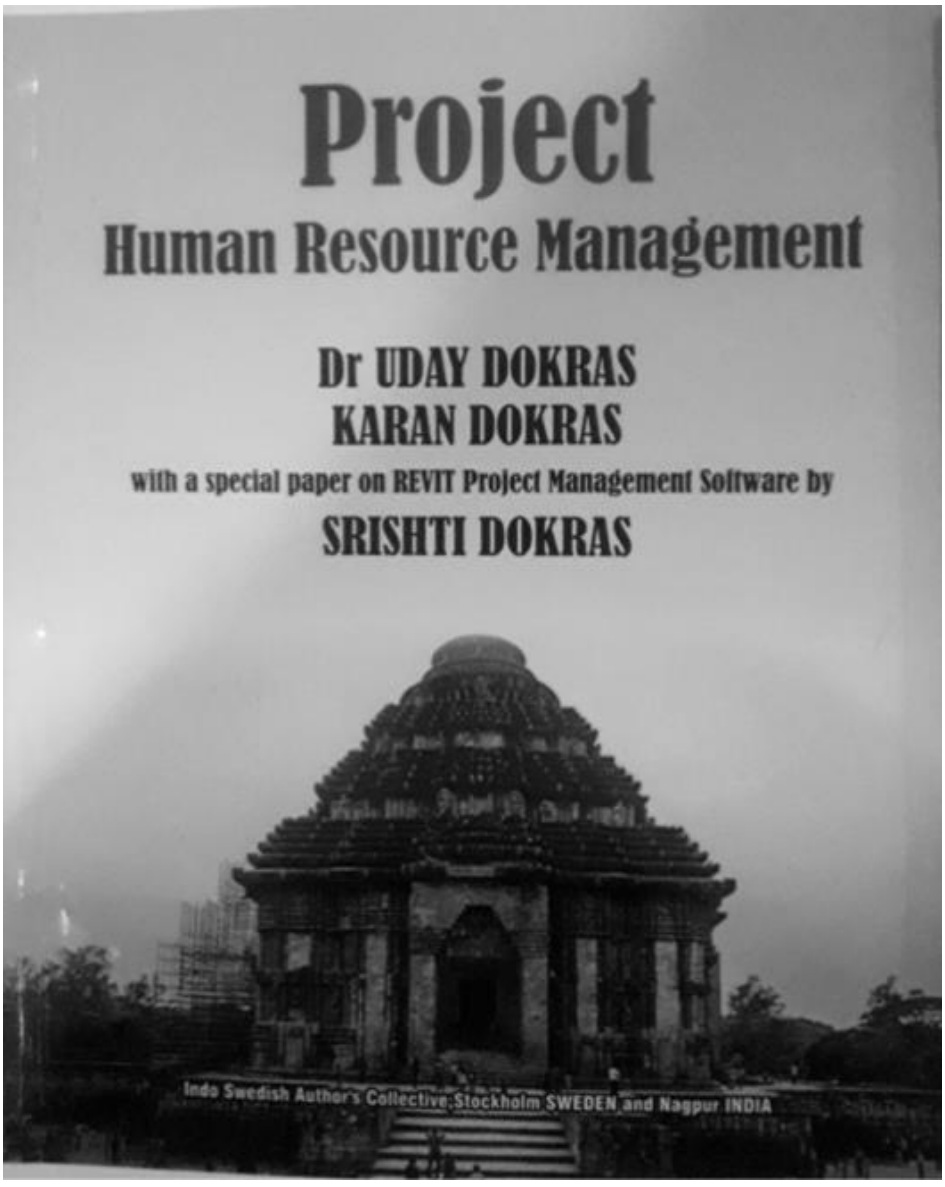
THEME PARK
HUMAN RESOURCE
ENGINEERING

A Comprehensive Guide to Managing Human Resource
in the Theme Park Industry

Forward by ***Shri Balwant Singh***
Chairman
Polo Amusement Group

Dr. Uday Dokras
Dean
Sewa Management Institute
Nagpur

Mansse Bhandari
Chief Executive Officer
Fun N Food Village
Nagpur


Project
Human Resource Management
Dr UDAY DOKRAS
KARAN DOKRAS
with a special paper on REVIT Project Management Software by
SRISHTI DOKRAS
Indo Swedish Authors Collective,Stockholm SWEDEN and Nagpur INDIA

Pre-Publication Reviews of PROJECT HUMAN RESOURCE MANAGEMENT

The authors highlight the benefits of paying attention to human resources and offer success and failure factors guideline for a variety of potential practitioners and students in global project marketplace.
Ms.Ylva Arnold, Head HR- Norstedts Publishers, Stockholm SWEDEN

As a librarian of 40 years standing, I have seen many books and this one falls in the TOP 10.

Written lucidly with a penchant for good drafting and story telling type format, CANT PUT IT DOWN, GO BUY 1

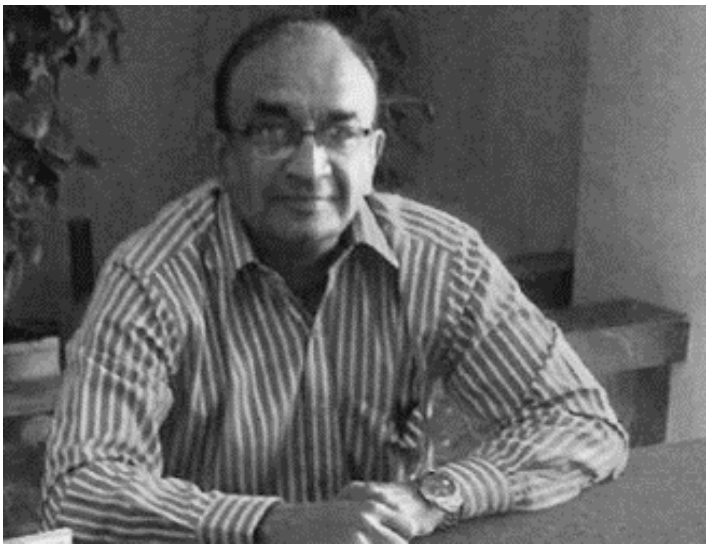
ANN JARVINEN
LIBRARIAN, University of Stockholm, Stockholm, University,

SWEDEN

A B O U T the A U T H O R

Karan Dokras is Head of New Product Development, Retail Sales, and Operations and a Member of the Strategic Core Team || AKIVA, Gurgaon, Haryana, India

Former Founder Kettle & Brew Beverages Pvt Ltd
Part of IT Projects in Infosys, BMC Software, CAP GEMINI and Tech Mahindra
This is his second book



Uday Dokras

Dr Dokras' 4th book launched

■ Staff Reporter

THE fourth book of Dr Uday Dokras was launched in a small function held recently at Maharajbag Club.

Joginder Uberoi, Chartered Accountant, launched the book. The book of Dr Uday Dokras is titled 'Project Human Resource Management'. His two co-authors are son Karan and daughter Srishti, both working in Information Technology sector. Dr Dokras is a consultant to Gorewada Zoo.

The 350-page book explains how human resources are to be managed in project space. With the hectic project building activity nowadays, the book is of immense value in project knowledge domain, stated a press release issued by Dr Dokras. As many as 1,35,000 copies of Madarin translation of this book have already been contracted to a Chinese firm.

The author Dr Uday Dokras (Left) with Joginder Singh, co-authors Karan and Srishti Dokras at the launch of book 'Project Human Resource Management'.